







Consistency of recommendations of clinical practice guidelines in periodontology: a systematic review

Marco Antonio ALARCÓN^(a) 
Tania ARIZA-FRITAS^(a) 
Natali CHAVEZ-VEREAU^(a) 
Andrea LÓPEZ-PACHECO^(a) 
Claudio Mendes PANNUTI^(b) 
Lilian MÁLAGA-FIGUEROA^(a) 

^(a)Cayetano Heredia Peruvian University, Academic Department of Clinical Stomatology, PeriImplant Research Group UPCH, Lima, Perú.

^(b)Universidade de São Paulo – USP, School of Dentistry, Department of Periodontology, São Paulo, SP, Brazil.

Declaration of Interests: The authors certify that they have no commercial or associative interest that represents a conflict of interest in connection with the manuscript.

Corresponding Author:

Andrea López-Pacheco
E-mail: andrea.lopez.p@upch.pe

<https://doi.org/10.1590/1807-3107bor-2023.vol37.0029>

Submitted: January 12, 2022
Accepted for publication: September 19, 2022
Last revision: October 19, 2022

Abstract: The aim of this systematic review was to evaluate the methodological quality and the consistency of recommendations of clinical practice guidelines (CPGs) in Periodontology. An electronic search was conducted in two databases, MEDLINE and EMBASE, eight CPGs databases, and home pages of scientific societies in Periodontology up to April 2022. Three reviewers independently assessed methodological quality using the AGREE II instrument. In addition, we evaluated the consistency of the recommendations. Eleven CPGs were included, and the topics developed focused on prevention, diagnosis, risk factors, surgical and non-surgical periodontal treatment, antimicrobial therapy, root coverage, and maintenance. We found that the AGREE domains 2 (Stakeholder involvement) and 5 (Applicability) obtained the lowest scores. Domains 1 (Scope and purpose), 3 (Rigor of development) and 4 (Clarity of presentation) obtained the highest scores among the evaluated CPGs. The clinical recommendations for treatment of periodontal diseases were mostly consistent. Overall, the quality of CPGs used in periodontics was high. There was consistency of recommendations in specific fields. These findings may help researchers to promote CPGs focused on different fields of periodontics that have not yet been developed. Furthermore, the clinician will be able to make better clinical decisions.

Keywords: Periodontics; Evidence-Based Dentistry; Dentistry; Oral Health.

Introduction

Clinical practice guidelines (CPGs) are comprehensively developed statements designed to assist practitioners and patients make appropriate health care decisions for specific clinical circumstances.¹ The statements contain recommendations based on the best available evidence, *e.g.*, systematic reviews (SR) and synthesis of the published medical literature. However, there may still be topics in dentistry for which no systematic reviews or meta-research are available.² Currently, different institutions and scientific societies have published CPGs to provide recommendations about various topics in dentistry.³⁻⁵

Periodontal disease is the 11th most prevalent disease in the world. It may lead to tooth loss and disability, it negatively affects



chewing function, aesthetics, quality of life and is even associated with SARS-COV2 infection complications.^{6,7} Periodontology encompasses prevention, diagnosis, and treatment of diseases of tooth-supporting tissues, besides tissue regeneration and esthetics of these tissues.⁸

To date, some evidence-based guidelines are available in Periodontics, such as the American Dental Association (ADA)⁹ guideline and the recently published European Federation of Periodontology (EFP)¹⁰ guideline, both of which are based on the treatment of periodontal disease. It is important to identify and appraise other clinical practice guidelines produced so far in periodontics. The findings could be helpful in developing new public health policies by adapting existing guidelines or in generating new CPGs in specific fields of periodontics.

It is of paramount importance that CPGs are of sufficient quality to allow the implementation of clear and effective recommendations.¹¹ Poor quality guidelines may compromise clinician's decisions and patient care. There are concerns in medicine and dentistry regarding the quality of CPGs. There is evidence that most CPGs do not adhere to the best methodological design.^{12,13} Furthermore, some countries adopt and/or adapt existing CPGs to their context, leading to a vast variability in CPG quality¹⁴. It would be expected that the recommendations would be consistent if the topics of these guidelines are similar, since they should follow the same methodological quality.

The Appraisal of Guidelines Research and Evaluation (AGREE II) tool is a validated instrument used to evaluate the methodological quality and transparency of clinical guidelines.^{14,15} Appropriate use of AGREE II will result in a correct elaboration of a CPG.

To the best of our knowledge, the methodological quality and the consistency of recommendations of consensus guidelines in periodontology have not been evaluated yet. Thus, the objective of this SR was to assess the methodological quality of CPGs in the field of Periodontology and the consistency of recommendations. A secondary objective was to evaluate the fields of periodontics that have developed CPGs.

Methodology

This systematic review was registered in the PROSPERO database under number CRD42021230566 and was written following the Prisma (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) statement.¹⁶

Focused question

What is the methodological quality and the consistency of recommendations in CPGs of diagnosis, prevention, maintenance, and treatment of periodontal diseases and conditions?

Eligibility criteria

We used PICAR statements to organize the reporting of information.¹⁷

Population, clinical indication(s), and condition(s):

Study population: Humans only.

Clinical indication: diagnosis, prevention, maintenance, and treatment of periodontal diseases and conditions.

Interventions:

All clinical practice guidelines in periodontics.

Comparisons:

Any comparator or comparison. No specific CPG content was of interest.

Attributes of the CPG:

- CPGs in any language, from any region, and from any publisher;
- CPG published from 2009 onwards (date of publication of the AGREE II tool);
- Only the latest version of the CPGs;
- No minimum quality cut-off score for the AGREE II criteria was considered.

Recommendation characteristics

Must have 'recommendations' for the diagnosis, prevention, and treatment of periodontal diseases that are either explicitly highlighted as such in the document or mentioned in the body of the document but not explicitly identified as recommendations.

Exclusion criteria

Proposals of guidelines, consensus statements, expert consensus, workshops, institutional protocols, surgical technique guidelines, and CPGs focusing on implants or peri-implant diseases.

Search strategy

An electronic search was conducted in two databases: the National Library of Medicine (MEDLINE via PubMed) and EMBASE (via Ovid). The search strategy included the following combinations of key words that included “All Fields” and “MeSH Terms”: (((((((((((((((((((periodontitis OR (periodontal diseases)) OR (“periodontal examination”) OR (probing)) OR (periodontal index)) OR (clinical attachment loss)) OR (clinical attachment level)) OR (periodontal regeneration)) OR (guided tissue regeneration)) OR (root coverage)) OR (Gingivitis)) OR (subgingival curettage)) OR (root planning)) OR (periodontal surgery)) OR (gingivectomy)) OR (gingivoplasty)) OR (gingival diseases)) OR (Periodontium)) OR (Periodontics)) OR (Periodontology)) AND (((“clinical practice guidelines”) OR (CPG)) OR (“clinical guidelines”))). The following CPGs websites were also screened up to April 2022: National Institute for Clinical Excellence (NICE), Scottish Intercollegiate Network (SIGN), The New Zealand Guidelines Group, Institute for Health Technology Assessment (*Instituto de Evaluación de Tecnología en Salud*), Library of Clinical Practice Guides of the National Health System (*Biblioteca de Guías de Práctica Clínica del Sistema Nacional de Salud*), American Dental Association Center for Evidence-Based Dentistry (ADA), American College of Physicians Clinical Practice Guidelines, Guidelines International Network, National Guideline Clearinghouse. Also, an electronic screening of the grey literature was conducted in the Grey Literature Report and OpenGrey databases, as well as in websites of periodontics scientific societies, identified through FIPP, EFP and AAP, to detect potentially eligible titles.

Selection of CPGs

Two reviewers (TA, NC) conducted a three-stage selection independently and in duplicate (Figure).

The reviewers screened titles and abstracts of search results according to selection criteria. Potential articles and those with insufficient data to make a clear decision, were analyzed in full for the eligibility criteria. Disagreement between the above reviewers was resolved by discussion and consultation with a third author (MAA). The reasons for exclusion at this or later stages were recorded (Table 1).

Assessment of the consistency of recommendations

To determine the consistency of the recommendations, two independent reviewers (ALP, LMF) extracted the recommendations from the guidelines related to the diagnosis, prevention, and treatment of periodontal disease. The evaluation was made in the direction and strength of the recommendation. If all the recommendations are *for*, *against*, or *insufficient*, there is consistency. If one recommendation is *for* and another is *against*, then there is inconsistency in the direction of the recommendation. When there are several *for* and several *against*, the threshold for consistency is that 80% of the recommendations must agree in the direction of the recommendation.¹⁸

Assessment of consistency strength is only done if there is consistency in direction. If all the recommendations are *strong* or *weak*, then there is consistency in strength. If we have a strong recommendation and a weak recommendation, we say that there is inconsistency in the strength of the recommendation. *Insufficient* recommendations are considered weak.¹⁸

We compared CPGs addressing the same topic to assess the direction of recommendations in guidelines. It was registered as *for* if the source recommended a diagnostic criterion or a certain treatment; *against*, if the source explicitly did not recommend the use of a diagnostic criterion or a certain treatment; *insufficient*, if the source did not specify the topic described, and *not reported* if the source did not mention that topic.

The recommendation was categorized as *strong* if the source was rated at the highest level according to the tool used to evaluate the level of recommendation of each CPG, if it was based on the

Table 1. Excluded articles and respective reasons.

Organization (Year)	Guideline	Reason for exclusion
Ministry of Health - Peru (2005)	Clinical practice guidelines in dentistry	Institutional protocols
Ministry of Health - Peru (2011)	Clinical practice guidelines of periodontics	Institutional protocols
Ministry of Health - Mexico (2011)	Clinical practice guidelines for prevention, diagnosis, and treatment of odontogenic infections in adults in first and second level of care	Proposals of guidelines
British Society of Periodontology and The British Society of Pediatric Dentistry (2012)	Guidelines for periodontal screening and management of children and adolescents under 18 years of age	Proposals of guidelines
British Society of Periodontology (2012)	Young practitioners guide to periodontology	Proposals of guidelines
Spain Society of Periodontology and Osseointegration (2012)	Diagnostic guide and periodontal treatment	Proposals of guidelines
National University of Colombia School of Dentistry (2013)	Guide for the care in periodontics	Unclear methodology
Colombian Health Inc. (2013)	Management guides and dental diagnosis - periodontology	Unclear methodology
San Rafael Hospital - Colombia (2013)	Clinical guidelines of chronic and acute gingivitis	Unclear methodology
Ministry of Health - Chile (2013)	Clinical guidelines for pregnant women - quick reference guide	Not related to periodontics
British Society of Periodontology (2016)	The good practitioner's guide to periodontology	Proposals of guidelines
Ministry of Health - Malaysia (2016)	Clinical practice guidelines	Proposals of guidelines
American College of Prosthodontists (2016)	Clinical practice guidelines for recall and maintenance of patients with tooth-borne and implant-borne dental restorations	Not related to periodontics
Indian Society of Periodontology (2020)	Management of periodontal disease in patients with diabetes- good clinical practice guidelines: A joint statement by Indian Society of Periodontology and Research Society for the Study of Diabetes in India.	Unclear methodology

highest level of evidence, or if it used a definitive language that implied the highest level of obligation or expectation to follow the recommendation. The recommendation was considered *weak* if the source rated the recommendation below the highest level of recommendation, level of evidence, or used nondefinitive language that implied a lower degree of obligation or expectation to follow the recommendation, and *different* if it was not clear enough to suggest whether the recommendation was strong or weak or if there was not a sufficient level of evidence to make an accurate recommendation.¹⁸

Quality assessment

We used the AGREE II tool to evaluate the methodological quality, accuracy, and reliability of guidelines.¹⁴ MAA conducted a pilot test for training

and calibration with a sample of randomly selected studies to ensure the accuracy and consistency of data extraction and evaluation. The level of agreement between reviewers was calculated using Cohen's kappa coefficient and interpreted according to Landis and Koch scale.¹⁹

Three calibrated authors (TA, NC, and LMF) independently applied the AGREE II tool in triplicate in a standardized format containing the 23 items covering six domains. Items are rated using a seven-point scale ranging from 'strongly disagree' to 'strongly agree', representing the assessor's confidence in whether the guidelines meet the quality of reporting and AGREE II criteria. Between rounds of data evaluation, assessors discussed the outcomes comprehensively to improve the homogeneity of assessment.

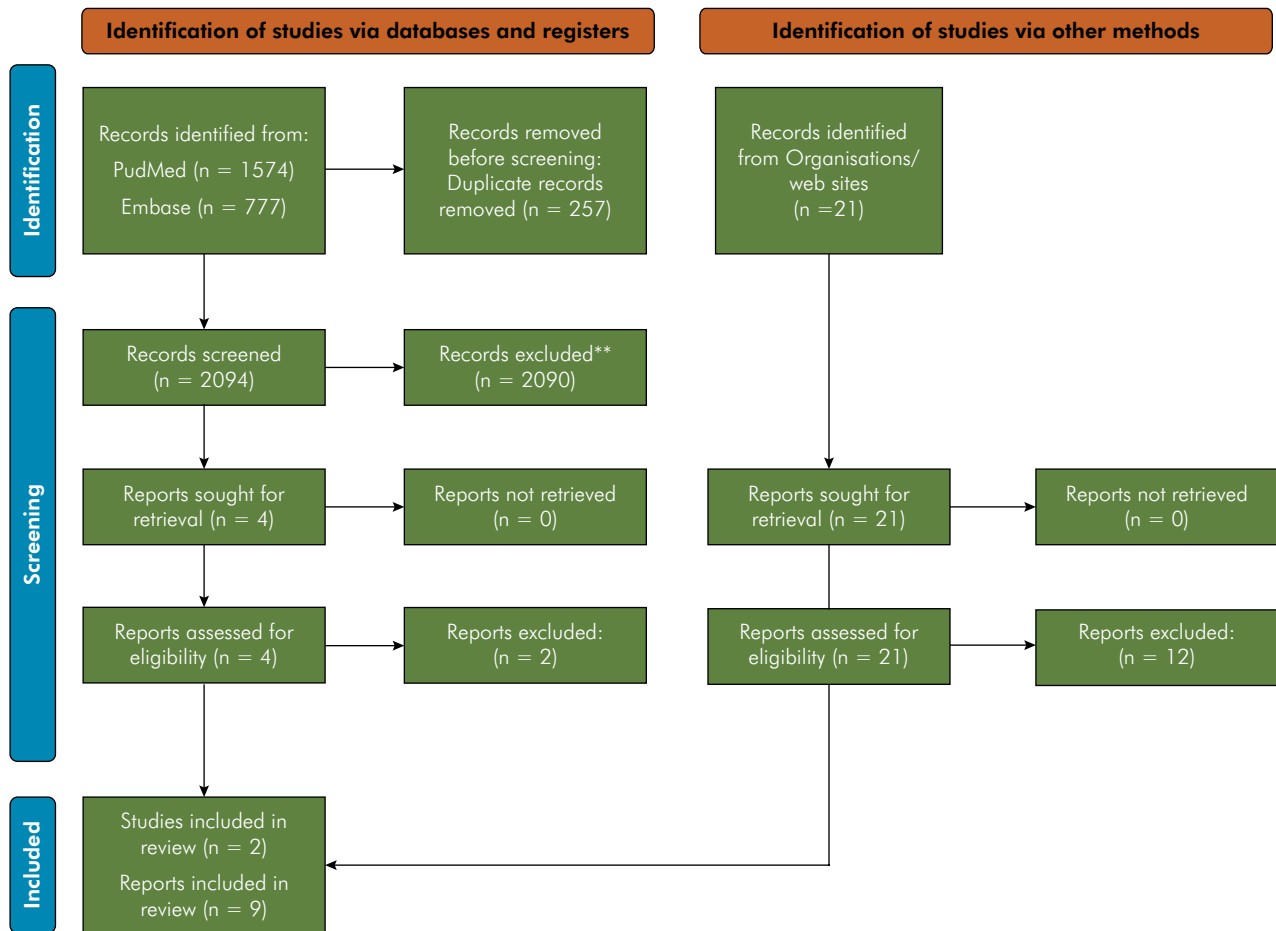


Figure. Prisma flowchart diagram.

The overall quality was considered *high* if CPGs scored 60% in at least three of six AGREE II domains, including Domain 3, *moderate* if three AGREE II domains scored 60%, except Domain 3, and *low* if CPGs scored 60% in two or more domains and 50% in Domain 3.¹⁷

Data analysis

We conducted a descriptive analysis to describe the basic features of the data in the included guidelines. The consistency in direction and strength of recommendations related to the prevention, diagnosis and treatment in periodontics were compared and analyzed. Finally, the current prevention/diagnosis and treatment recommendations for periodontics were summarized and the consistency of recommendations on various diagnostic and

therapeutic options were examined. Consistency of recommendations was evaluated through the coincidences of recommendations in the evaluated CPGs.

Results

Data collection

In the initial search, a total of 2376 records were found in the electronic and manual searches. After removing duplicates and screening titles and abstracts, 25 remained for full-text assessment (Figure). Eleven CPGs were finally included in this systematic review. The reviewers showed an almost perfect level of agreement ($k = 0.92$). The most common reasons for exclusion were guidelines based on consensus meeting, expert consensus, and

workshops without the explicit definition of CPGs. The excluded papers and reasons for exclusion are listed in Table 1.

Eligible CPGs were published from 2011 to 2020, and six were developed in Europe, one in North America, two in Latin America, and two in Asia. Most CPGs were funded by dental scientific societies. Two included non-dental scientific societies in their work team.^{20,21} The following topics were covered: diagnosis, associated factors, surgical and non-surgical periodontal treatment, antimicrobial therapy, unitary root coverage, and supportive periodontal therapy (Table 2).

Four different tools were used to assess the level of evidence and grade of recommendation: Scottish Intercollegiate Guidelines Network (SIGN),²²⁻²⁴ Shekelle y cols,²⁰ American Dental Association (ADA),⁹ and Association of the Scientific Medical Societies in Germany (AWMF).^{10,21,25}

Recommendations concerning analysis of medical and dental risk factors, basic periodontal exam (BPE), and oral hygiene instruction (OHI) for prevention and diagnosis of periodontal disease were consistent in direction, but were inconsistent in strength (Table 3). For the analysis of non-surgical and surgical periodontal treatment, the recommendations were consistent in direction, but inconsistent in strength. The analysis demonstrated that consistency for photodynamic therapy was against the recommendation, while for regenerative surgery, the consistency was in the direction of recommendation. Recommendations for adjunctive antibiotic therapy were inconsistent in direction, as four CPGs recommended adjunctive antibiotics for the treatment of periodontitis^{9,20-22} but four other CPGs did not recommend^{10,24-26} (Table 4).

We could not evaluate the consistency of the recommendations regarding the diagnosis with periapical or panoramic radiographs, root coverage, and complete oral disinfection therapy since these issues were evaluated by only one guideline.

Quality assessment

According to recommendations, all CPGs scored adequately in at least three of six domains including domain 3 (rigor of development), thus obtaining

an overall *high-quality* score. Domains 1 (Scope and purpose), 3 (Rigor of development), and 4 (Clarity of presentation) obtained the highest score and domain 5 (Applicability) obtained the lowest score (Table 5).

Discussion

In this study, we found 11 clinical practice guidelines, which suggests a lack of worldwide guidelines in a specialty as broad as periodontics. According to the AGREE II instrument, the guidelines produced by multiple institutions and academic organizations were of high quality.

We found guidelines from different continents. We observed a trend for more publications of original guidelines in high-income countries, while in low-income countries (*e.g.*, Perú and India), CPGs were adapted from other guidelines. A possible explanation for this could be the absence of organizations involved in guidelines elaboration, less support and funding from government agencies for guideline development in low-income countries, and the lower likelihood that guidelines will be published in indexed journals.¹² Another reason for adaptations is that most high-quality CPGs are developed for high-income countries with different resources for clinical practice than low-income countries. Difficulties and limitations of adaptation processes include a) lack of knowledge for organizing and planning the resources and time needed for the whole process and b) lack of methodological expertise. Considering the above reasons, CPG adaptation is an alternative in low-income countries.

Although it seems that the overall quality of guidelines has improved over the past decades,²⁷ whereas the report of the type and involvement of stakeholders seem to be especially poor. The report on stakeholder participation in the design, development, and implementation of CPG demonstrates transparency and endures that an agreed and/or published stakeholder participation plan has been followed, and explains and justifies any changes made to the stakeholder participation plan as a result of adaptive management.¹¹ For example, for the development of a CPG about

Table 2. Characteristics of the included CPGs.

Title	Organization	Country	Year	Work team	Topics of guidelines	Recommendation tool
Oral health assessment and review. Guidance in brief.	The Scottish Dental Clinical Effectiveness Programme	Scotland	2011	Dental scientific societies	Diagnosis Risk factor	NR
Management of chronic periodontitis.	Oral Health Division Ministry of Health Malaysia	Malaysia	2012	Periodontists Dental scientific societies	Diagnosis Non-surgical and surgical treatment Antimicrobial therapy Supportive periodontal therapy.	SIGN
Clinical practice guidelines: diagnosis and management of oral problems in elderly people.	Mexican Social Security Institute	Mexico	2012	Dental scientific societies Non dental scientific societies	Diagnosis Non-surgical treatment	Shekelle y cols.
Prevention and treatment of periodontal diseases in primary care dental clinical guidance	The Scottish Dental Clinical Effectiveness Programme	Scotland	2014	Dental scientific societies	Diagnosis Surgical treatment Supportive periodontal therapy	NR
Surgical treatment of single gingival recessions: clinical guidelines	National Association of Italian Dentists	Italy	2014	Dental academics Dental scientific societies Periodontists Patients	Surgical treatment	SIGN
Evidence-based clinical practice guideline on the nonsurgical treatment of chronic periodontitis by means of scaling and root planning with or without adjuncts	American Dental Association	United States	2015	Dental academics Dental scientific societies Periodontists	Nonsurgical treatment Antimicrobial therapy	ADA
Adjuvant systemic administration of antibiotics for subgingival instrumentation in the context of systematic periodontitis therapy.	German Society for Periodontology. German Society for Dentistry, Oral and Maxillofacial Medicine	Germany	2018	Dental scientific societies Non dental scientific societies	Non-surgical and surgical treatment Antimicrobial therapy	AWMF
Clinical practice guidelines for prevention, diagnosis and treatment of gingivitis and chronic periodontitis.	Ministry of Health Peru	Peru	2019	Dental academics Dental scientific societies Periodontists Patients	Diagnosis Non-surgical and surgical treatment Supportive periodontal therapy	SIGN

Continue

Continuation

Treatment of stage I-III periodontitis –The EFP S3 level clinical practice guideline	European Federation of Periodontology	Europe	2020	Dental scientific societies	Diagnosis Non-surgical and surgical treatment Supportive periodontal therapy	AWMF
BSP implementation of European S3 - level evidence-based treatment guidelines for stage I-III periodontitis in UK clinical practice	European Federation of Periodontology, and British Scientific Societies	United Kingdom	2021	Dental scientific societies	Diagnosis Non-surgical and surgical treatment Supportive periodontal therapy	AWMF
Management of periodontal disease in patients with diabetes- good clinical practice guidelines: a joint statement by Indian Society of Periodontology and Research Society for the Study of Diabetes in India	Indian Society of Periodontology and Research Society for the Study of Diabetes in India	India	2020	Dental scientific societies Non dental scientific societies	Diagnosis Risk factor	NR

*NR: not reported; SIGN: Scottish Intercollegiate Guidelines Network; Shekelle, Modified Shekelle scale; ADA: American Dental Association; AWMF: Association of the Scientific Medical Societies in Germany .

Table 3. Consistency analysis of prevention and diagnosis recommendations of periodontics guidelines.

Guideline	Medical and dental risk factor	BPE	OHI	Periapical radiographs	Panoramic radiograph
Scotland, 2011	+	+	+	+	+
Malaysia, 2012	+	++	++		
Mexico, 2012	++		+		
Scotland, 2014			+		
Italy, 2014					
United States, 2015					
Germany, 2018	+++				
Peru, 2018	++	+++			
Europe, 2020	+++		+++		
UK, 2021	+++		+++		
India, 2020	+	+	+		

BPE: basic periodontal exam; OHI: oral hygiene instruction; Direction of recommendations: green; against: red. Strength of the recommendation: + different; ++ weak, +++ strong.

periodontal maintenance, the participation of a specialist, hygienist, general dentist, and patients are important since they all can provide better ideas after interpreting the results found.⁴² On the other hand, we observed that funding and declaration and

management of interests were correctly reported, which provides assurance about possible bias in current recommendations. Assessment, reporting, and critical appraisal of potential sponsorship bias of meta-analytic estimates are of paramount

Table 4. Consistency analysis of periodontal treatment recommendations of periodontic guidelines.

Guideline	Non-surgical treatment					Surgical treatment					SPT
	SRP mechanic	SRP ultrasonic	Photodynamic therapy	Full mouth disinfection	Full mouth SRP	Conventional staged debridement	Open flap debridement	Regenerative surgery	Resective surgery	Adjunctive antibiotic therapy	3-6 month
Scotland, 2011											
Malaysia, 2012	+++	+++		+++	+++	+++	+++	+++	+++	+++	+++
Mexico, 2012										++	
Scotland, 2014	+	+			+	+				++	+
Italy, 2014											
United States, 2015	+++		++							++	
Germany, 2018										+++	
Peru, 2018	+									+++	+++
Europe, 2020	+++	+++	++		++	++	++	+++	++	+++	+++
UK, 2021	+++	+++	++		++	++	++	+++	++	+++	+++
India, 2020											+

SRP: scaling and root planning; OHI: oral hygiene instructions; SPT: supportive periodontal therapy; Direction of recommendations: for green: insufficient, red: against; Strength of the recommendation: + different; ++ weak, +++ strong.

Table 5. AGREE II results.

AGREE II	Domain 1	Domain 2	Domain 3	Domain 4	Domain 5	Domain 6	Overall quality
Guideline	Scope and purpose	Stakeholder involvement	Rigor of development	Clarity of presentation	Applicability	Editorial independence	
Scotland, 2011	95%	85%	96%	96%	79%	95%	High
Malaysia, 2012	83%	59%	90%	97%	48%	75%	High
Mexico, 2012	89%	56%	79%	85%	67%	86%	High
Scotland, 2014	95%	86%	91%	90%	70%	93%	High
Italy, 2014	97%	100%	86%	97%	81%	54%	High
United States, 2015	80%	57%	93%	96%	75%	93%	High
Germany, 2018	100%	100%	100%	100%	92%	100%	High
Peru, 2019	100%	96%	100%	100%	83%	88%	High
Europe, 2020	100%	77%	100%	100%	92%	100%	High
UK, 2021	100%	96%	98%	100%	79%	100%	High
India, 2020	100%	61%	29%	79%	70%	100%	High

importance in providing proper guidance for clinical treatments.

The constant scientific advance makes it imperative that CPGs are updated. This critical issue has been recently addressed by the living systematic

reviews, where evidence is continuously updated and incorporated as soon as available in the literature through a process of continuous surveillance.^{28,29} The validity of each recommendation and of the CPG is determined by the methodological quality and the

transparency of its development and by the “living evidence” on which it is based. As suggested by Martínez Garcia et al.,³⁰ waiting more than three years to review a guideline may be too long because the recommendations may already be outdated by the time of guideline publication. Based on this, we suggest that the CPGs included in this study should be updated in a period of less than five years.

The objective of a CPG is to provide evidence-based recommendations that help clinical decision-making. In this study, we found many useful recommendations for the management of periodontal patients. This SR recommends the following clinical protocol when examining a new patient based on the diagnostic criteria: a) Identifying all patients suspected of having periodontitis; b) Confirming the diagnosis of periodontitis; c) Staging the periodontitis case; and d) Grading the periodontitis case.³¹

Regarding non-surgical periodontal treatment, there was consistency in the recommendations, which can be summarized in: a) Professional instructions for good oral hygiene should be provided to reduce plaque and gingivitis; b) Re-enforcement of oral hygiene instructions may provide additional benefits; c) Manual or electric tooth brushing are recommended as a primary means of reducing plaque and gingivitis; d) When gingival inflammation is present, the use of interdental brushes should be professionally taught to patients; e) Professional mechanical plaque removal is recommended, which consist of interventions aimed at removing supragingival plaque and calculus and plaque-retentive factors; and 6) Risk factors such as smoking and diabetes should be controlled.^{32,33}

When non-surgical periodontal treatment does not have a favorable response, the next step, according to consistent recommendations, can be summarized as: 1) Access flap periodontal surgery; 2) Resective periodontal surgery, and 3) Regenerative periodontal surgery.^{32,33}

To our knowledge, the consistency of the CPG recommendations in dentistry has not been previously described. It is interesting to note that, unlike clinical guidelines in medicine,^{18,34,35} the recommendations of clinical guidelines on periodontology were consistent in direction. The

main controversy and the only inconsistency was in the use of adjuvant antibiotic therapy for the treatment of periodontal disease. This could be due to the wide range of drugs and doses used in periodontics. In addition, this lack of coherence may be mostly due to the different definitions of periodontal disease used by each guide, different publication dates, different methods of selection and interpretation of the evidence, and different preferences and indications.

In periodontal research, researchers have used different definitions for periodontal disease. For standardization purposes, the periodontal diagnosis should be recorded following the latest classification of the 2017 World Workshop on the classification of periodontal and peri-implant diseases and conditions.³⁶ In the current classification system, periodontal health is defined as the absence of inflammation and absence of attachment and bone loss from previous periodontitis. A case of clinical gingivitis is defined as the presence of gingival inflammation as assessed by bleeding on probing at $\geq 10\%$ of the sites and absence of detectable attachment loss due to previous periodontitis. A periodontitis case is defined as loss of periodontal tissue support, which is defined as the presence of bone loss or interproximal loss of clinical attachment measured by radiographic examination.¹⁰ We recommend that guidelines update their recommendations according to the new classification of periodontal diseases³⁶ to avoid confusion when interpreting the recommendations.

Although there was a general consistency in direction, CPGs lack consistency in the strength of recommendations. This may be related to the lack of high-quality scientific evidence on some topics in periodontology, especially in primary studies reported in different systematic reviews, which are often used as sources of information to issue recommendations.³⁷

Despite the different CPGs in periodontology, there may be barriers to their application in all populations. Many potential factors may limit the adoption of evidence, including CPGs, into clinical practice, such as knowledge and awareness of the guidelines, individual/professional barriers,

cognitive factors, attitudes and social barriers, and organizational and economic context (e.g., culture of the network, leadership, financial arrangements, capacity, and resources).³⁸

Limitations of this systematic review include potential selection bias, since there is no specific registration center for guidelines in dentistry that could help us perform a more comprehensive search. Only CPGs published in journals and online databases were included. Furthermore, CPGs published in the form of books or government documents were not analyzed. This could limit the comprehensiveness of grey literature search. Likewise, it was not possible to make comparisons between guideline recommendations due to the different instruments used to grade the recommendations. We strongly believe that CPGs should be developed using validated methodology (the use of GRADE is recommended) and updated regularly.

This study was the first attempt to assess the methodological quality of CPGs on periodontics

using the AGREE II tool. Only 11 guidelines met the inclusion criteria and were included. Considering the high prevalence of periodontitis and the different topics covered by periodontics, the number of guidelines that were eventually included in this study was lower than expected. This systematic review demonstrated that the AGREE II tool can serve as an adequate reference for the development of CPGs on Periodontics. The knowledge on the quality and applicability of CPGs may help clinicians make the right clinical decisions.

Conclusion

The quality of CPGs in periodontics was high. Furthermore, there was consistency in recommendations for the diagnosis and treatment of periodontal diseases. Developers of future CPGs should fully disclose the involvement of stakeholders and standardize the clinical diagnosis criteria according to the current classification system.

References

1. Kredo T, Bernhardsson S, Machingaidze S, Young T, Louw Q, Ochodo E, et al. Guide to clinical practice guidelines: the current state of play. *Int J Qual Health Care*. 2016 Feb;28(1):122-8. <https://doi.org/10.1093/intqhc/mzv115>
2. Faggion CM Jr, Listl S, Smits KP. Meta-research publications in dentistry: a review. *Eur J Oral Sci*. 2021 Feb;129(1):e12748. <https://doi.org/10.1111/eos.12748>
3. Krämer S, Lucas J, Gamboa F, Peñarrocha Diago M, Peñarrocha Oltra D, Guzmán-Letelier M, et al. Clinical practice guidelines: oral health care for children and adults living with epidermolysis bullosa. *Spec Care Dentist*. 2020 Nov;40(1 Suppl 1):3-81. <https://doi.org/10.1111/scd.12511>
4. Stanford CM. Academy of Osseointegration's Summit on Clinical Practice Guidelines for the Edentulous Maxilla: Overview, Process, and Outcomes-Changing the Face of Implant Dentistry. *Int J Oral Maxillofac Implants*. 2016;31 Suppl:s6-15. <https://doi.org/10.11607/jomi.16suppl.ovw>
5. Bidra AS, Daubert DM, Garcia LT, Kosinski TF, Nenn CA, Olsen JA, et al. Clinical practice guidelines for recall and maintenance of patients with tooth-borne and implant-borne dental restorations. *J Prosthodont*. 2016 Jan;25(1 Suppl 1):S32-40. <https://doi.org/10.1111/jopr.12416>
6. Vos T, Abajobir AA, Abate KH, Abbafati C, Abbas KM, Abd-Allah F, et al. Global, regional, and national incidence, prevalence, and years lived with disability for 328 diseases and injuries for 195 countries, 1990-2016: a systematic analysis for the Global Burden of Disease Study 2016. *Lancet*. 2017 Sep;390(10100):1211-59. [https://doi.org/10.1016/S0140-6736\(17\)32154-2](https://doi.org/10.1016/S0140-6736(17)32154-2)
7. Marouf N, Cai W, Said KN, Daas H, Diab H, Chinta VR, et al. Association between periodontitis and severity of COVID-19 infection: A case-control study. *J Clin Periodontol*. 2021 Apr;48(4):483-91. <https://doi.org/10.1111/jcpe.13435>
8. American Academy of Periodontology. Chicago: AAP Connect; 2022 [cited 2022 Apr 1]. Available from: <https://members.perio.org/libraries/glossary/entry?GlossaryKey=66c5a4be-316d-4b12-846c-523eee79d9c7&tab=groupdetails>
9. Smiley CJ, Tracy SL, Abt E, Michalowicz BS, John MT, Gunsolley J, et al. Evidence-based clinical practice guideline on the nonsurgical treatment of chronic periodontitis by means of scaling and root planing with or without adjuncts. *J Am Dent Assoc*. 2015 Jul;146(7):525-35. <https://doi.org/10.1016/j.adaj.2015.01.026>

10. Sanz M, Herrera D, Kebschull M, Chapple I, Jepsen S, Beglundh T, et al.; EFP Workshop Participants and Methodological Consultants. Treatment of stage I-III periodontitis-The EFP S3 level clinical practice guideline. *J Clin Periodontol*. 2020 Jul;47(22 Suppl 22):4-60. <https://doi.org/10.1111/jcpe.13290>
11. Mubeen S, Patel K, Cunningham Z, O'Rourke N, Pandis N, Cobourne MT, et al. Assessing the quality of dental clinical practice guidelines. *J Dent*. 2017 Dec;67:102-6. <https://doi.org/10.1016/j.jdent.2017.10.003>
12. Madadian MA, Benning A, Fan K, Pandis N, Seehra J. Quality assessment of clinical practice guidelines used in oral and maxillofacial surgery. *Int J Oral Maxillofac Implants*. 2020 Mar;49(3):403-10. <https://doi.org/10.1016/j.ijom.2019.08.003>
13. Madera M, Franco J, Solà I, Bonfill X, Alonso-Coello P. Screening and diagnosis of oral cancer: a critical quality appraisal of clinical guidelines. *Clin Oral Investig*. 2019 May;23(5):2215-26. <https://doi.org/10.1007/s00784-018-2668-7> PMID:30284100
14. AGREE Collaboration. Development and validation of an international appraisal instrument for assessing the quality of clinical practice guidelines: the AGREE project. *Qual Saf Health Care*. 2003 Feb;12(1):18-23. <https://doi.org/10.1136/qhc.12.1.18>
15. Brouwers MC, Kho ME, Browman GP, Burgers JS, Cluzeau F, Feder G, et al.; AGREE Next Steps Consortium. AGREE II: advancing guideline development, reporting and evaluation in healthcare. *CMAJ*. 2010;182(18):E839-42. <https://doi.org/10.1503/cmaj.090449>
16. Page MJ, Moher D, Bossuyt PM, Boutron I, Hoffmann TC, Mulrow CD, et al. PRISMA 2020 explanation and elaboration: updated guidance and exemplars for reporting systematic reviews. *BMJ*. 2021 Mar;372(160):n160. <https://doi.org/10.1136/bmj.n160>
17. Johnston A, Kelly SE, Hsieh SC, Skidmore B, Wells GA. Systematic reviews of clinical practice guidelines: a methodological guide. *J Clin Epidemiol*. 2019 Apr;108:64-76. <https://doi.org/10.1016/j.jclinepi.2018.11.030>
18. Alper BS, Price A, van Zuuren EJ, Fedorowicz Z, Shaughnessy AF, Oettgen P, et al. Consistency of Recommendations for Evaluation and Management of Hypertension. *JAMA Netw Open*. 2019 Nov;2(11):e1915975. <https://doi.org/10.1001/jamanetworkopen.2019.15975>
19. Landis JR, Koch GG. The measurement of observer agreement for categorical data. *Biometrics*. 1977 Mar;33(1):159-74. <https://doi.org/10.2307/2529310>
20. Instituto Mexicano del Seguro Social. Dirección de Prestaciones Médicas. Unidad de Atención Médica. Guía de práctica clínica GPC: diagnóstico y manejo de los problemas bucales en el adulto mayor: evidencias y recomendaciones. Mexico DF: Instituto Mexicano del Seguro Social; 2012 [cited 1 Apr 2021]. Available from: <http://www.imss.gob.mx/sites/all/statics/guiasclinicas/583GER.pdf>
21. Jockel-Schneider Y, Pretzl B, Ehmke B, Schlagenhau U. Adjuvante systemische Antibiotikagabe bei subgingivaler Instrumentierung im Rahmen der systematischen Parodontitistherapie. S3-Leitlinie (Kurzversion). *Parodontologie (Berl)*. 2018;29:387-98.
22. Ministry of Health (Malaysia). Oral Health Division. Management of chronic periodontitis. 2nd ed. Putrajaya: GPG Secretariat; 2012 [cited 1 Apr 2021]. Available from: <https://www.moh.gov.my/moh/attachments/8817.pdf>
23. Pini-Prato G, Nieri M, Pagliaro U, Giorgi TS, La Marca M, Franceschi D, et al. Surgical treatment of single gingival recessions: clinical guidelines. *Eur J Oral Implantology*. 2014;7(1):9-43.
24. Ministerio de Salud (Peru). Resolución Ministerial N° 324-2019/MINSA. [Guía de práctica clínica para la prevención, diagnóstico y tratamiento de la gingivitis inducida por placa dental y periodontitis]. Lima: Ministerio de Salud del Perú; 2018. [cited 1 Apr 2021]. Available from: https://cdn.www.gob.pe/uploads/document/file/306236/Resolución_Ministerial_N__324-2019-MINSA.pdf
25. West N, Chapple I, Claydon N, D'Aiuto F, Donos N, Ide M, et al. BSP implementation of European S3: level evidence-based treatment guidelines for stage I-III periodontitis in UK clinical practice. *J Dent*. 2021 Mar;106:103562. <https://doi.org/10.1016/j.jdent.2020.103562>
26. Scottish Dental Clinical Effectiveness Programme. Prevention and treatment of periodontal diseases in primary care: guidance in brief. Dundee: Scottish Dental Clinical Effectiveness Programme; 2014 [cited 1 Apr 2021]. Available from: <https://www.sdcep.org.uk/media/djpv13/sdcep-periodontal-disease-guidance-in-brief.pdf>
27. Plint AC, Moher D, Morrison A, Schulz K, Altman DG, Hill C, et al. Does the CONSORT checklist improve the quality of reports of randomised controlled trials? A systematic review. *Med J Aust*. 2006 Sep;185(5):263-7. <https://doi.org/10.5694/j.1326-5377.2006.tb00557.x>
28. Elliott JH, Synnot A, Turner T, Simmonds M, Akl EA, McDonald S, et al.; Living systematic review network. living systematic review: 1. Introduction-the why, what, when, and how. *J Clin Epidemiol*. 2017 Nov;91:23-30. <https://doi.org/10.1016/j.jclinepi.2017.08.010>
29. Shojania KG, Sampson M, Ansari MT, Ji J, Doucette S, Moher D. How quickly do systematic reviews go out of date? A survival analysis. *Ann Intern Med*. 2007 Aug;147(4):224-33. <https://doi.org/10.7326/0003-4819-147-4-200708210-00179>
30. Martínez García L, Sanabria AJ, García Alvarez E, Trujillo-Martín MM, Etxeandia-Ikobaltzeta I, Kotzeva A, et al. The validity of recommendations from clinical guidelines: a survival analysis. *CMAJ*. 2014 Nov;186(16):1211-9. <https://doi.org/10.1503/cmaj.140547>
31. Tonetti MS, Sanz M. Implementation of the new classification of periodontal diseases: decision-making algorithms for clinical practice and education. *J Clin Periodontol*. 2019 Apr;46(4):398-405. <https://doi.org/10.1111/jcpe.13104>
32. Chapple IL, Van der Weijden F, Doerfer C, Herrera D, Shapira L, Polak D, et al. Primary prevention of periodontitis: managing gingivitis. *J Clin Periodontol*. 2015 Apr;42(16 Suppl 16):S71-6. <https://doi.org/10.1111/jcpe.12366>
33. Van der Weijden FA, Slot DE. Efficacy of homecare regimens for mechanical plaque removal in managing gingivitis a meta review. *J Clin Periodontol*. 2015 Apr;42(16 Suppl 16):S77-91. <https://doi.org/10.1111/jcpe.12359>

34. Yu Y, Wang D, Zhou Q, Wang C, Ma X, Gao Y, et al. Recommendations in clinical practice guidelines on gout: systematic review and consistency analysis. *Clin Exp Rheumatol*. 2020 Sep-Oct;38(5):964-72.
35. Kow CS, Capstick T, Zaidi ST, Hasan SS. Consistency of recommendations from clinical practice guidelines for the management of critically ill COVID-19 patients. *Eur J Hosp Pharm Sci Pract*. 2021 Jan;28(1):42-6. <https://doi.org/10.1136/ejhp-2020-002388>
36. Caton JG, Armitage G, Berglundh T, Chapple IL, Jepsen S, Kornman KS, et al. A new classification scheme for periodontal and peri-implant diseases and conditions - Introduction and key changes from the 1999 classification. *J Periodontol*. 2018 Jun;89 Suppl 1:S1-8. <https://doi.org/10.1002/JPER.18-0157>
37. Faggion CM Jr, Listl S, Alarcón MA. Is the evaluation of risk of bias in periodontology and implant dentistry comprehensive? A systematic review. *J Clin Periodontol*. 2015 May;42(5):488-94. <https://doi.org/10.1111/jcpe.12394>
38. Grol R, Wensing M. What drives change? Barriers to and incentives for achieving evidence-based practice. *Med J Aust*. 2004 Mar;180 S6:S57-60. <https://doi.org/10.5694/j.1326-5377.2004.tb05948.x>

Consistency of recommendations of clinical practice guidelines in periodontology: a systematic review. *Braz Oral Res.* 2023;37:e029.

Author's name

Where is read: Tania ARIZA-FREITAS

Should read: Tania ARIZA-FRITAS

Legend

Where is read: *Alarcón MA, Ariza-Freitas T, Chavez-Vereau N, López-Pacheco A, Pannuti CM, Málaga-Figueroa L*

Should read: *Alarcón MA, Ariza-Fritas T, Chavez-Vereau N, López-Pacheco A, Pannuti CM, Málaga-Figueroa L*

<https://doi.org/10.1590/1807-3107bor-2023.vol37.0029.erratum>

