

A practical approach to evidence-based dentistry: VII

How to use patient management recommendations from clinical practice guidelines

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SEVENTH IN A SERIES

In previous articles published as part of this series on evidence-based dentistry, we provided an overview of evidence-based clinical practice,¹ explained how to search for² and critically appraise articles about therapy,³ harm,⁴ diagnosis,⁵ and described how to use systematic reviews.⁶ In this article, we define clinical

practice guidelines, describe the process of developing guidelines and the basic components of a recommendation, and provide a structure for determining the trustworthiness of recommendations about patient management included in clinical practice guidelines.



Supplemental material is available online.

ABSTRACT

Background and Overview. Clinical practice guidelines represent highly processed evidence with associated recommendations to inform clinical practice and optimize patient care. Appropriately developed, evidence-based recommendations will integrate the best evidence regarding benefits and harms, the certainty of the evidence, patients' values and preferences, and resource utilization.

Practical Implications. The authors provide a structure for clinicians to critically appraise clinical practice guidelines to determine whether the guidelines offer trustworthy recommendations.

Key Words. Clinical practice guidelines; GRADE approach; recommendation; quality of evidence; strength of recommendations; patients' values and preferences; evidence-based dentistry.

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BOX 1

Clinical scenario.

You meet with a 63-year-old edentulous patient who was referred to your practice for full-mouth rehabilitation with dental implants. During the physical examination, the patient mentions that he has a prosthetic hip joint implant, which was placed 5 years ago. Although you are aware that for many years the standard of care was to provide antibiotic prophylaxis to patients with joint implants before performing invasive dental procedures, you also know that this practice has been questioned in recent years. The patient, who has received antibiotic prophylaxis routinely for dental procedures since having his joint replacement, is skeptical about proceeding without a prophylactic regimen. When planning the patient's dental implant surgery, you decide to consult the available recommendations about the use of antibiotic prophylaxis in patients with prosthetic joints and share with your patient the available evidence on this matter.

EVIDENCE-BASED CLINICAL PRACTICE GUIDELINES

According to the Institute of Medicine⁷ of the National Academies, clinical practice guidelines are "...statements that include recommendations intended to optimize patient care that are informed by a systematic review of evidence and an assessment of the benefits and harms of alternative care options." Although the authors of evidence-based guidelines follow a systematic process to identify, select, assess, and summarize evidence, they rely on the consensus of a group of decision makers, also known as a guideline panel. After reviewing the evidence, the panel typically recommends a specific course of action on the basis of the implications for those who may be affected by the recommendation. The panel's mission is to interpret the available evidence and to consider the clinical context in which the recommendations will be applied.

Because of differences in clinical contexts and in clinicians' attitudes toward benefits and harms, members of various guideline panels might evaluate the same body of evidence but not necessarily make the same recommendations. For example, there are major discrepancies between the recommendations formulated by guideline panels from the American Heart Association (AHA)⁸ and the National Institute for Health and Care Excellence (NICE)⁹ regarding the use of antibiotic prophylaxis for preventing infective endocarditis in patients who are at risk for developing this condition and who are undergoing invasive dental procedures. In 2008, both of these guideline panels^{8,9} conducted rigorous systematic reviews that showed similar results. Although the AHA recommended the use of prophylaxis for patients with particular cardiac conditions, NICE recommended against its use in all patients, regardless of the perceived susceptibility of the patient to develop infective endocarditis. In this case, AHA guideline panelists placed a higher value on the potential benefit of the intervention than the adverse events and cost, whereas NICE panelists considered that the risk and cost of antibiotic prophylaxis

outweighed the minimal benefits of administering the intervention.

STRUCTURED PROCESS OF DEVELOPING MANAGEMENT RECOMMENDATIONS

Decision making is ubiquitous in clinical practice. Consciously or unconsciously, clinicians weigh the potential short- and long-term benefits and harms, burden of the treatment, and costs associated with alternative courses of action to arrive at a decision consistent with the patient's best interest.¹⁰ By consulting guidelines whose authors have documented in a systematic manner both the evidence and the rationale for specific recommendations, clinicians can make sound decisions about clinical options for typical patients.

The process of developing recommendations begins when an institution or an organization defines a health care problem as a priority and initiates a call to develop guidelines to address the health care problem. After defining the scope of the guideline (for example, focusing on primary, secondary, or tertiary care) and the target audience (for example, dentists, other health care professionals who contribute to the management of oral conditions), the institution or organization selects a panel of experts and charges the panel with the task of defining the questions the guideline will answer. These questions include details about patients, clinical options (that is, one or more courses of action), and target outcomes. Using the questions, the panel (which may be expanded to include other collaborators such as information specialists and clinical epidemiologists) undertakes systematic searches of the literature to identify the highest quality available evidence, arrive at the best estimates of benefits and harms, and assess their certainty or confidence in those estimates. On the basis of evidence summaries generated from this process, the panel formulates and grades the strength of the recommendations. After producing and publishing the guideline, the panel can monitor its implementation and update the guideline when new evidence emerges (Figure 1).^{10,11}

WHERE TO FIND CLINICAL PRACTICE GUIDELINES

Specific databases presenting full versions or brief summaries of evidence-based clinical practice guidelines are available. For example, by using the Trip database (www.tripdatabase.com), clinicians can find references to guidelines, which are organized according to the region

ABBREVIATION KEY. AAOMS: American Association of Oral and Maxillofacial Surgeons. AAOS: American Academy of Orthopedic Surgeons. ADA: American Dental Association. AHA: American Heart Association. GRADE: Grading of Recommendations Assessment, Development and Evaluation. NICE: National Institute for Health and Care Excellence. USPSTF: US Preventive Service Task Force.

in which they were developed, and links to full texts of guidelines. Databases that provide summaries of guidelines relevant to dentistry include the National Guideline Clearinghouse (www.guideline.gov) and the American Dental Association (ADA) Center for Evidence-Based Dentistry (<http://ebd.ada.org/en/evidence/>).

BOX 2

The clinical practice guideline you found.

You discover that in 2012, the American Academy of Orthopedic Surgeons (AAOS) and the American Dental Association (ADA) guideline panel¹² conducted a systematic review to inform practitioners about the use of antibiotic prophylaxis in patients with prosthetic joints who required invasive dental procedures, and accordingly, formulated a recommendation. In 2014, the ADA Council on Scientific Affairs formed a new guideline panel with the mission of reformulating and further clarifying the 2012 recommendation.^{12,15} This guideline panel¹³ updated the systematic review from 2012,¹² focusing on outcomes important to patients and therefore disregarding the evidence about surrogate outcomes (for example, bacteremia). The panel formulated the new recommendation using the ADA's system to assess the level of certainty and strength of the recommendation. Because you want to use the most updated document to select the course of action to take with your patient, you decide to review the ADA recommendation that was published in January 2015¹³ on this topic.

CRITICALLY APPRAISING PATIENT MANAGEMENT RECOMMENDATIONS

Irrespective of whether the recommendations address preventive, diagnostic, or therapeutic interventions, clinicians need to determine the extent to which a clinical practice guideline provides trustworthy recommendations.

1. Are the recommendations clear and comprehensive? Optimal recommendations use a standardized format that clearly describes the suggested course of action, which alternatives were considered, and to which group of patients and under what specific clinical circumstances the recommendations apply.¹⁴

Clinicians should only follow guidelines when dealing with “typical” patients because exceptions can arise. For example, a clinician should amend all recommendations regarding antibiotics or anesthetics if a patient is allergic to a particular drug. Also, if a clinician is determining the course of action in the case of a patient who might need antibiotic prophylaxis before undergoing dental procedures, for example, the clinician should consider whether the patient has had a prior joint infection or an immune deficiency.

The extent to which guidelines should address the more common of the atypical or unusual clinical situations is a matter for the guideline panel to consider. For example, the authors of clinical guidelines may face criticism for failing to address the likelihood of multimorbidity, which commonly occurs in patients in a clinical practice.

In whatever way a panel decides to address atypical or unusual clinical situations, it is likely that they will find it impossible to foresee all the idiosyncratic situations

that could arise in patient care. This is one reason that following clinical guidelines should not supersede following a clinician's judgment; instead, clinical guidelines should provide the sort of guidance that, it is hoped, will apply to most or even nearly all of the situations that typically confront clinicians. Therefore, clinicians should anticipate that guidelines will address a broad range of patients, including most of the kinds of patients that a clinician is likely to see. Guidelines that do not do this provide only limited assistance for clinical care.

1a. Is the recommended intervention clear and actionable? Sometimes recommendations are too vague to provide a clear course of action to clinicians. For example, consider the following recommendation: In children, teenagers, or young adults undergoing cancer treatment—“if any invasive dental procedure is required, this should be undertaken by either a consultant or specialist pediatric dentist as appropriate.”¹⁵ Although this recommendation attempts to inform clinicians about the type of dental professional to whom they should refer a cancer patient who requires an invasive dental procedure, it fails to be specific, referring to this professional as a “consultant” (any dental professional in any specialty can be classified as a consultant). In addition, the recommendation provides 2 options (consultant or specialist pediatric dentist) without offering clear guidance about when or how to choose either option. An additional limitation is the use of the expression “as appropriate,” without providing additional information about how clinicians should determine what is and what is not appropriate. Another issue that may influence clinicians' ability to act on a recommendation is a potential discrepancy between the intended population or type of patients that the panel members defined and the type of patient a clinician has in the dental chair. The credibility of recommendations is lower when the guideline panel's definition of the patients is vague or when the patients are different from the ones the clinician wants to apply the recommendations to.

Another example is provided in the guideline addressing the prevention of orthopedic implant infection in patients undergoing dental procedures, which was developed by the American Academy of Orthopedic Surgeons (AAOS) and the ADA in 2012.¹² The authors declared, “We are unable to recommend for or against the use of topical oral antimicrobials in patients with prosthetic joint implants or other orthopedic implants undergoing dental procedures,” and graded the recommendation as “inconclusive.”^{12,16} Clinicians interested in using topical oral antimicrobials in this type of patient would find no guidance from the AAOS and ADA guideline¹² and, forced to rely on their own resources (in situations in which they perhaps cannot spend the time nor have the skills to make their own assessment of the relevant evidence), could become understandably frustrated. In contrast, a guideline by the ADA Council

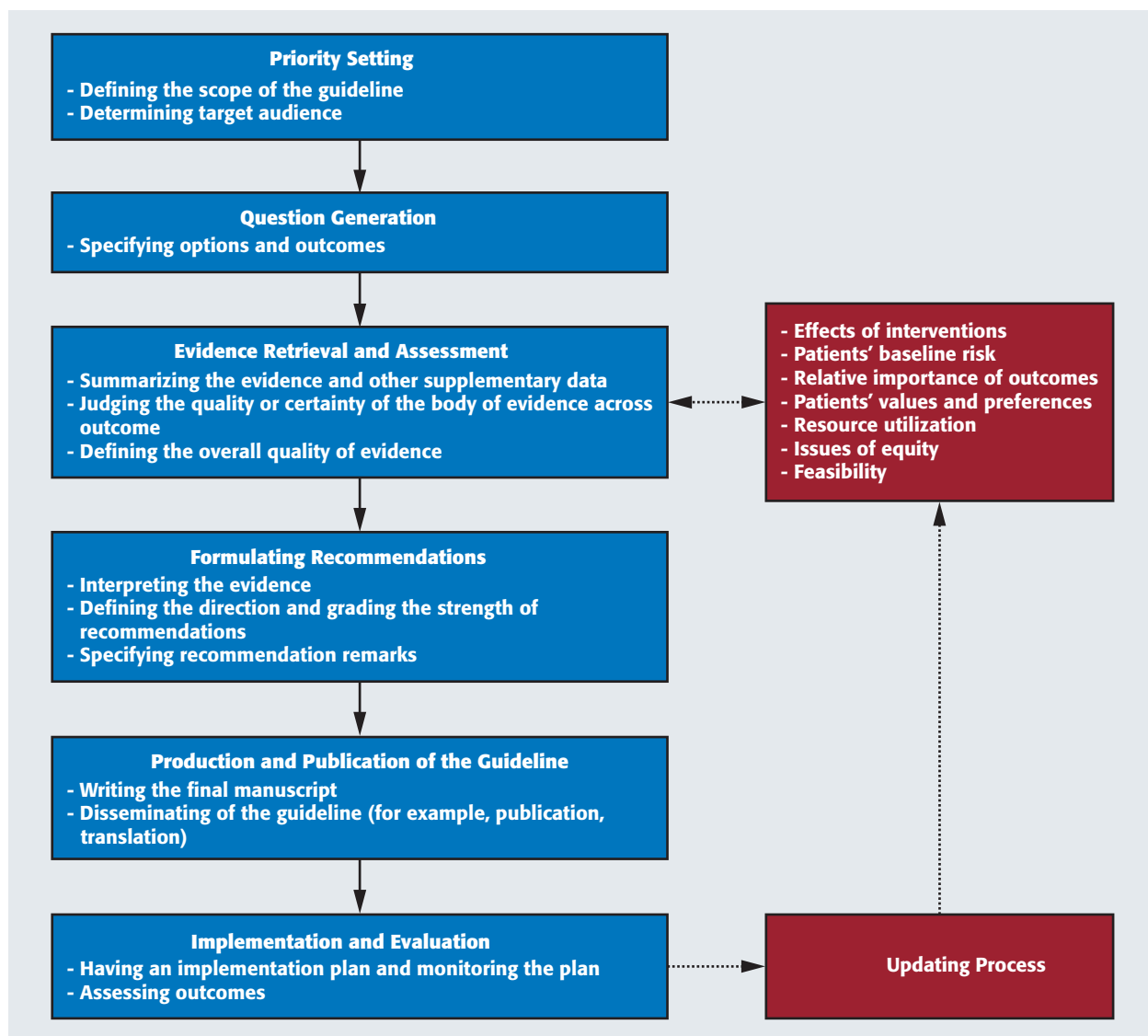


Figure 1. The process of developing and updating clinical guidelines.

on Scientific Affairs¹³ states the following: “In general, for patients with prosthetic joint implants, prophylactic antibiotics are not recommended prior to dental procedures to prevent prosthetic joint infection.”¹³ In this case, a clear course of action is defined (although it would be optimal if the recommendation were worded so that it is clearly a recommendation against prophylaxis, such as, “We recommend against the use of prophylaxis,” omitting the potentially frustrating qualification “In general” that suggests that there are exceptions that the recommendation has not specified).

1b. Is the alternative clear? Many times, for a particular clinical problem, clinicians may use a range of potentially effective treatments. When formulating

recommendations, the guideline panel should state explicitly what options they considered. If the alternative course of action is not stated clearly, the recommendation remains ambiguous. For example, consider the following recommendation: “Advise adults that use of sucrose-free polyol (xylitol only or polyol combinations) chewing gum for 10 to 20 minutes after meals may reduce incidence of coronal caries.”¹⁷ Should clinicians advise patients to use chewing gum for 10 to 20 minutes after meals as opposed to not chewing gum at all, or when tooth brushing is not possible, or in addition to tooth brushing? This recommendation is unclear about whether chewing gum can replace tooth brushing or whether it should be considered an adjuvant measure to reduce the risk of coronal caries.

Moreover, it is unclear whether clinicians simply should provide patients with information or encourage use of the gum. Recommendation statements should be clear and complete enough to be used and interpreted without the need to read the full text of the guideline.

1c. Were all the relevant outcomes important to patients explicitly considered? For any recommendation, the guideline panel should determine the balance between the benefits and the harms. This balance depends on the outcomes that were identified as being relevant for decision making. Clinicians assessing the trustworthiness of recommendations should judge whether the panel considered all patient-important outcomes. A patient-important outcome is an outcome for which—even if it were the only outcome improved by treatment—the patient still would consider receiving the intervention, in the face of some adverse effects, costs, and burden.^{18,19}

Examples of patient-important outcomes in dentistry include having a prosthetic joint infection after undergoing an invasive dental procedure, oral health-related quality of life, tooth loss, pain, trismus, esthetic issues, or dental implant failure. Surrogate outcomes may not be considered to be important individual outcomes, but they are associated with patient-important outcomes. Unfortunately, the effects of interventions on surrogates do not guarantee beneficial effects on the associated patient-important outcomes.²⁰ Surrogate outcomes in dentistry include bacteremia after an invasive dental procedure, levels of pocket probing depth, clinical attachment level, and bleeding on probing.²¹ When guideline panels use surrogate outcomes to determine the balance between benefits and harms, the resulting recommendations are less credible than when the guideline panel bases recommendations on patient-important outcomes.

BOX 3

Your assessment of whether the clinical recommendation is clear and comprehensive.

You notice that the panel for the American Dental Association (ADA) guideline published in 2015¹³ addressed the following question: “For patients with prosthetic joints... should systemic antibiotics be prescribed before patients with prosthetic joint implants undergo dental procedures?” The answer the panel stated in their recommendation is as follows: “In general, for patients with prosthetic joint implants, prophylactic antibiotics are not recommended prior to dental procedures to prevent prosthetic joint infection.”¹³ Although the words “in general” initially may confuse clinicians, the panel not only provided an actionable description about how clinicians should act when treating a patient with this condition, they also described in their remarks the exceptional situations in which they would still suggest using prophylaxis. In the recommendation, the panel placed a high value on avoiding adverse drug reactions and antibiotic-associated costs and on addressing patient-important outcomes.

You also notice that the 2015 ADA guideline¹³ provides a brief summary of the clinical reasoning for the recommendation and the key points to share with patients when making this decision. This contrasts with the 2012 guideline by American Academy of Orthopedic Surgeons and ADA,¹² in which the panel emphasized the outcome bacteremia, presumably believing that a reduction in bacteremia would lead to a reduction in prosthetic joint infection.

2. Was the recommendation made on the basis of the best current evidence? Guideline panelists formulating recommendations should use the best available current evidence. Clinicians using recommendations should focus on the methodology of the systematic review(s) conducted to identify, select, assess, and summarize the relevant evidence. To determine the credibility of this process, users of clinical guidelines should determine whether the literature search was comprehensive, reproducible, and current.⁶

Recommendations made on the basis of the results of systematic reviews whose authors used suboptimal or unclear methods are less credible.¹⁴ For example, the longstanding practice of prescribing antibiotic prophylaxis for all patients with prosthetic joints who need invasive dental procedures,²² probably “just to be on the safe side,” was common before 1997 when no guidelines using a systematic approach to review and summarize the literature on the topic were available. In 1997, the ADA and AAOS conducted an exhaustive review of the literature to determine whether antibiotic prophylaxis was effective in these patients.²³ On the basis of all the evidence, the 1997 guideline panel recommended (for the first time in history) against the use of antibiotic prophylaxis in patients with prosthetic joints who were undergoing invasive dental procedures, a situation that determined a dramatic change in clinical practice.²³ The contrast in clinical practice before and after the 1997 recommendation²³ highlights the value of conducting comprehensive systematic reviews of the literature to inform decision making.

BOX 4

Your assessment of the methods of the systematic review informing the guideline you identified.

You note that the panel who produced the American Dental Association (ADA) guideline published in 2015¹³ primarily based their recommendations on the results of the 2012 systematic review conducted by the American Academy of Orthopedic Surgeons and ADA guideline panel¹² as well as on an update of the evidence from 2012 to 2014. In their systematic review, they described in detail the search strategy implemented and the dates and databases they consulted. You note that they also checked the reference lists found in relevant studies to identify additional studies to consider. You identify some limitations, such as the inclusion of articles published only in English and the lack of information regarding whether the selection of studies was conducted independently by at least 2 researchers. When you read how the panel assessed the quality of evidence, you notice that, although the panel¹⁵ presented the levels of certainty and their meaning, they did not describe the process they followed to determine this quality. Finally, you notice that the panel explained the process they used for formulating the recommendations. Although you would have expected to see a more detailed description of the process for selecting and assessing the evidence, you determine that the methods the authors of the guideline implemented to conduct the systematic review provide a moderate level of credibility to the recommendation.^{12,13}

3. Are values and preferences associated with the outcomes appropriately specified? Another important issue is the preference or relative importance that patients attribute to some outcomes over others.¹⁴ Patients’

values and preferences are expressions that include "...patients' perspectives, beliefs, expectations, and goals for health and life. More precisely, they refer to the processes that people use when considering the potential benefits, harms, costs, limitations, and inconvenience of the management options in relation to one another. For some, the term 'values' has the closest connotation to these processes. For others, the connotation of 'preferences' best captures the notion of choice. Thus, we use both words together to convey the concept."²⁴

For example, when looking for recommendations about the management of unerupted and impacted mandibular third molars, we noted that the Scottish Intercollegiate Guidelines Network (SIGN)²⁵ and NICE²⁶ recommend avoiding the prophylactic surgical removal of these molars unless the eruption process clearly is associated with pathological events such as infection, caries, and cyst formation, among others. Although the American Association of Oral and Maxillofacial Surgeons (AAOMS)²⁷ provides a similar recommendation when the third molar is affected pathologically, their recommendation also supports the early removal of third molars, even before an associated pathology is apparent: "Whenever possible, treatment should be provided before the pathology has adversely affected the patient's oral and/or systemic health."²⁷ The panel members explain their rationale as follows: "Treatment of impacted teeth at an early age is associated with a decreased incidence of morbidity and represents an efficient use of health care resources. Treatment at an older age carries with it an increase in the incidence and severity of perioperative and postoperative problems, a longer and more severe period of postoperative recovery, greater anesthetic risk and greater and more costly interference in daily activities and responsibilities."²⁷

Why did 3 guideline panels, using the same evidence collected in a systematic and rigorous manner, provide clinicians with varying recommendations? The SIGN²⁵ and NICE²⁶ guideline panels put a higher value on avoiding adverse events associated with the surgical removal of third molars and the potentially unnecessary costs of treating (that is, extracting) otherwise healthy erupted molars. On the other hand, the AAOMS panel²⁷ placed a higher value on avoiding future pathological or unfavorable events related to the retention of third molars, including having a higher risk for experiencing postoperative adverse events when this type of surgery is required in older patients. Clinicians should look for clear statements about the role that values and preferences played when formulating any recommendation and adjust their decision to meet the values and preferences of their own patients.

Ideally, the results of a systematic review of the available evidence addressing patients' values and preferences should inform the guideline panel and drive the recommendation. The American College of Dentists'

ethics handbook²⁸ states, "Decision processes based on ethical principles always consider the patient's best interests, as well as the patient's values and preferences. Risk management processes and decisions that do not include the perspective of the patient may be unethical."²⁸ Unfortunately, studies addressing patients' values and preferences are uncommon in the dental literature.²⁹⁻³³

When evidence exploring patients' values and preferences is not available, guideline panelists usually rely on the experiences of clinicians who deal with patients and decision making on a regular basis. Another option is to include at least 1 patient representative in the process of formulating recommendations.³⁴ The limitation of these less systematic approaches is the extent to which those invited to the guideline panel meeting are actually representative of the typical patient targeted for a particular recommendation.

Regardless of the sources that the panel used to learn about patients' values and preferences, clinicians using recommendations should look actively for a transparent and explicit description of this matter, and consider what their own patients' values and preferences regarding benefits and risks might be.

4. Do the authors indicate the strength of their recommendations? The authors of trustworthy recommendations provide clinicians with an assessment of the strength of the recommendations.¹⁴ In doing so, panels may rely on using one of many available systems to grade their recommendations. The available systems to grade recommendations—including the Grading of Recommendations Assessment, Development and Evaluation (GRADE) approach,³⁵ the ADA system,³⁶ and those used by the U.S. Preventive Service Task Force (USPSTF)³⁷ and the AHA³⁸—use diverse methods to represent confidence in the estimates of effect and the strength of their recommendations.^{39,40}

These 4 systems share 2 critical features. First, they provide an assessment of the confidence in the effect estimates. In the context of clinical practice guidelines, this assessment of confidence represents the extent to which the estimates support a decision or a recommendation (Figure 2¹⁴).⁴¹ The GRADE approach, which is by far the most widely used system, considers the following 4 levels of confidence (sometimes also described as *certainty* in the evidence) in the estimates of effect: high, moderate, low, and very low. Risk of bias, imprecision, indirectness, inconsistency, and publication bias can reduce this confidence in a given recommendation. The ADA system includes 3 levels: high, moderate, and low. This system uses the same domains described for the GRADE approach to determine the confidence in the effect estimates. Clinicians using guidelines should look for the guideline panel's rating of the degree of confidence and the reasons that influenced their assessment.

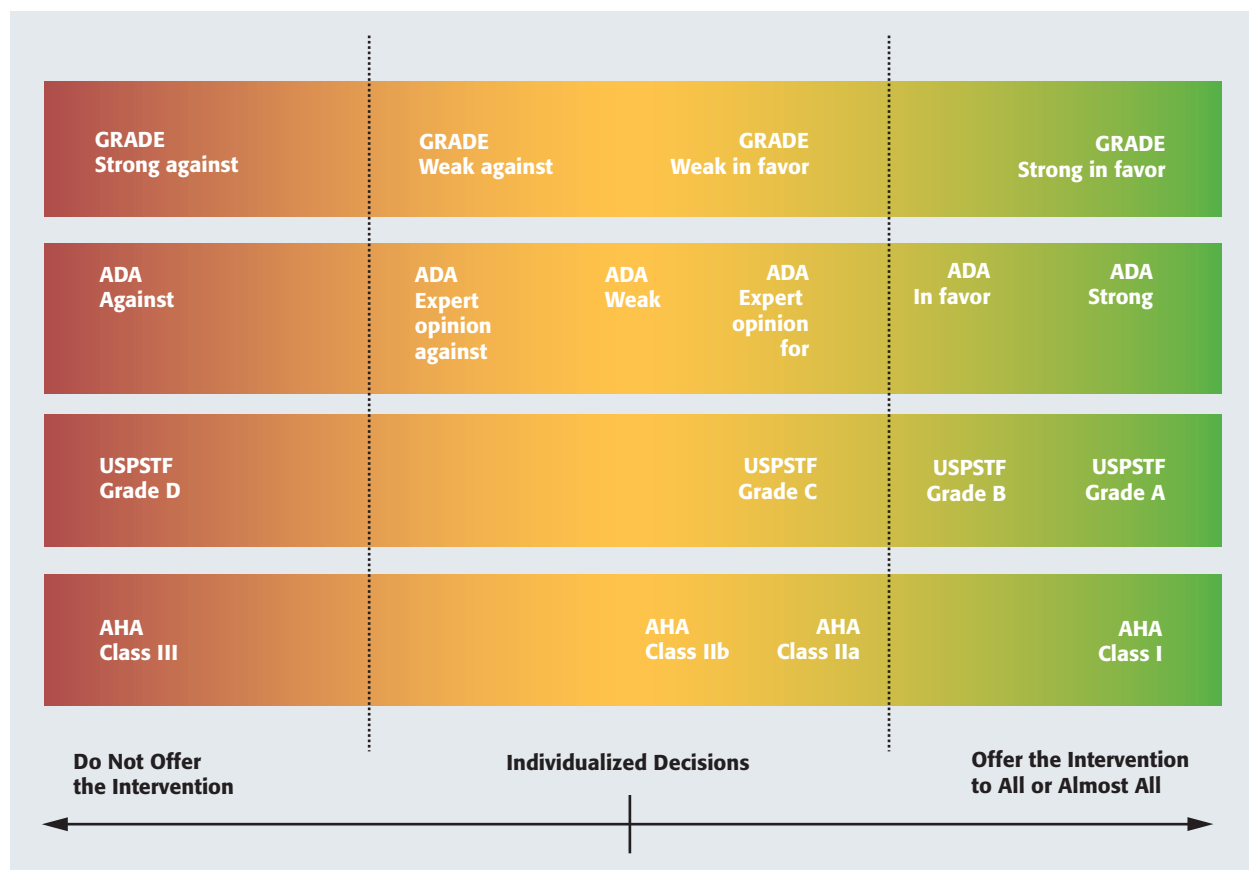


Figure 2. Assessment of the direction and strength of recommendations using different grading systems. ADA: American Dental Association. AHA: American Heart Association. GRADE: Grading of Recommendations Assessment, Development and Evaluation. USPSTF: United States Preventive Service Task Force. Adapted with permission of McGraw-Hill Education from Neumann and colleagues.¹⁴

Second, the systems discriminate between strong and weak recommendations. Whereas the GRADE system uses only 2 types of recommendations (strong and weak), the ADA system uses the following 6 grades for recommendations: strong (evidence strongly supports providing this intervention), in favor (evidence favors providing this intervention), weak (evidence suggests implementing this intervention after alternatives have been considered), expert opinion for (evidence is lacking; the level of certainty is low—expert opinion guides this recommendation), expert opinion against (evidence is lacking; the level of certainty is low—expert opinion suggests not implementing this intervention), and against (evidence suggests not implementing this intervention or discontinuing ineffective procedures).³⁶

For example, the ADA Council of Scientific Affairs formulated clinical recommendations addressing the use of nonfluoride caries-preventive agents. One of them¹⁷ states the following: “Using 0.12 percent chlorhexidine rinse alone or in combination with fluoride for prevention of coronal caries is not recommended.” The guideline

panel determined the strength of the recommendation as “against,” based on high-quality evidence.¹⁷

5. Is the evidence supporting the recommendation easily understood? 5a. For strong recommendations, is the strength appropriate? When a strong recommendation is provided, the message for clinicians is clear: “in almost all the cases, just do it.”¹⁴ When the right course of action depends on circumstances or is sensitive to patients’ values and preferences, such a strong recommendation is likely to have undesirable consequences.

Four domains influence the strength of a recommendation: the magnitude of benefits and harms, certainty in the evidence, patients’ values and preferences, and resource utilization.²⁴ A strong recommendation is more likely when the desirable consequences are many and important and undesirable consequences are few and unimportant; when there is high certainty in the evidence; when most patients place a high value in the desirable consequences; and when net costs are low. On the other hand, a weak or conditional recommendation is more likely when there are few and less important desirable

TABLE

Implications for strong and weak recommendations.	
RECOMMENDATION	IMPLICATIONS
Strong Recommendation for a Particular Intervention	For clinicians: Most patients should receive the recommended course of action. For patients: Most people in this situation would want to follow the recommended course of action, and only a small proportion of people would not want to follow it. For policy makers: The recommendation can be adapted as a policy in most situations.
Weak Recommendation for a Particular Intervention	For clinicians: Be prepared to help patients make a decision that is consistent with their own values (shared-decision making). For patients: Most people in this situation would want the recommended course of action, but many would not. For policy makers: There is a need for substantial debate and involvement of stakeholders.

consequences and many and more important undesirable consequences; low certainty in the evidence; low value placed on desirable consequences, or large uncertainty about values and preferences; and high net cost.

In general, clinicians should be cautious when presented with a strong recommendation on the basis of low-quality or very low-quality evidence. In this case, the message from the panel may be contradictory: in most situations clinicians have to implement the intervention (strong recommendation); however, we are uncertain or very uncertain about the evidence supporting this recommendation (low or very low confidence). There are, however, some specific situations that justify formulating a strong recommendation on the basis of low or very low confidence. Some of these exceptional scenarios are life-threatening situations, having equivalence between 2 options in which 1 is clearly cheaper or less risky, and when low confidence in the evidence suggests catastrophic harm.²⁴

5b. For weak recommendations, does the information provided facilitate shared decision making? When clinicians are presented with a weak or conditional recommendation, it means that in many cases it is best to follow the suggested course of action; in many other cases, however, the optimal course of action may differ. Guideline panelists should provide clinicians with the information they need when decisions are value- and preference-sensitive, to engage in shared decision making. Guidelines may provide this information in the remarks attached to each recommendation, in the recommendation rationale section, or in accompanying tables.

Weak recommendations mandate clinicians to engage in a bidirectional exchange of information with their patients—that is, shared decision-making.⁴² In this process, clinicians provide patients with the evidence from clinical research, whereas patients share with clinicians

their perspectives and values acquired from their own experience, social interaction, and other personal information. At the end of this deliberative process, both actors draw a conclusion and decide on the best course of action.^{42,43}

The table summarizes the implications of strong and weak recommendations for clinicians, patients, and policy makers.

BOX 5

The assessment of the quality of evidence and strength of the recommendation you identified.

You note that the panel who authored the American Dental Association (ADA) guideline published in 2015,¹³ using the ADA's grading system for generating clinical recommendations,³⁶ recommended—on the basis of evidence warranting moderate confidence—against the use of antibiotic prophylaxis in patients with a prosthetic joint undergoing invasive dental procedures. The ADA's grading system explains moderate certainty as follows: "As more information becomes available, the magnitude or direction of the observed effect could change, and this change could be large enough to alter the conclusion. This statement is based on preliminary determination from the current best available evidence, but confidence in the estimate is constrained by 1 or more factors, such as the number or size of studies; risk of bias of individual studies leading to uncertainty in the validity of the reported results; inconsistency of findings across individual studies; and limited generalizability to the populations of interest."³⁶ You note that the panel also needs to assess the effect of the intervention; the ADA's language for no effect is "no association." By announcing "moderate" confidence of no association, the direction of the recommendation is "against," and the strength is "strong." With the recommendation "against," the ADA guideline panel means "that evidence suggests not implementing this intervention or discontinuing ineffective procedures."¹³

Given the panel's strong recommendation, you and other clinicians may conclude that in all but exceptional circumstances, the undesirable consequences of antibiotic prophylaxis outweigh the desirable consequences. The panel noted that under exceptional circumstances, the use of antibiotics might be desirable.

6. Was the influence of conflict of interests minimized? Interpretation of evidence and the process of moving from interpreting evidence to making recommendations are tasks that are susceptible to conflicts of interest. Although investigators have documented the extent of conflicts of interest (particularly financial conflicts of interest) in medical clinical practice guidelines and found them to be considerable,⁴⁴⁻⁴⁸ clinical guideline panels have not explored the issue in dental guidelines. Intellectual conflicts of interest (for example, attitudes developed as a result of one's own previous research) or professional conflicts of interest (for example, loyalty to one's professional organization) also may influence recommendations.⁴⁹ Guidelines should report statements of the authors' conflicts of interest and implement strategies to minimize the impact of these conflicts of interest. Guidelines whose authors fail to report conflicts of interest have weak credibility. For example, a US Preventive Services Task Force guideline addressing the prevention of dental caries in children from birth through age 5 years provided a detailed

description of the panel members and their affiliations, potential conflicts of interest, financial disclosure, and the guideline source of funding.⁵⁰ Because these disclosures did not suggest any potential conflicts of interest, readers could consider the recommendations to be trustworthy.

On the other hand, in some situations, including the insights of panel members who may have potential intellectual or financial conflicts of interest is necessary to ensure that the panel includes optimal expertise. In such circumstances, clinician users of guidelines should look for documentation of strategies that minimized conflict (for example, ensuring that the chair of the panel does not have any conflicts of interest or having panel members who had conflicts of interest in certain areas recuse themselves during discussion or votes on specific issues).^{36,51} Failure to implement such measures in the presence of conflict of interest weakens a guideline's credibility.

BOX 6

Your assessment of the conflict of interest in the guideline you identified.

In the section "Preventing bias in an AAOS clinical practice guideline," the American Dental Association guideline panel¹² explained the process of identifying members of the panel who have conflicts of interest, included a detailed description of the potential conflicts of interest of all the members of the American Academy of Orthopedic Surgeons working group, and explained their strategies to deal with such conflicts that included recruiting a methodologist who did not have any conflicts of interest to be a key actor in the guideline development process.⁵² When you read this description, you and other clinicians using this guideline can be reassured that the guideline development group made efforts to minimize the effect of conflict of interest, which increases the trustworthiness of the guideline.

CONCLUSION

Clinicians in need of guidance regarding use of a diagnostic or a therapeutic strategy can benefit from referring to evidence-based recommendations provided by international or local organizations. Because some recommendations are more evidence-based and more credible than others, clinicians should assess each recommendation's credibility. Criteria for a trustworthy guideline include clear and actionable recommendations that were developed on the basis of the best available evidence, patients' values and preferences having been specified appropriately, the provision of a clear indication of the strength of the recommendation, and the use of an effective method to address issues of conflict of interest. Highly credible guidelines can assist clinicians with providing a succinct yet comprehensive summary of the balance between benefits and harms, the certainty of the evidence, patients' values and preferences, and costs of

an intervention. However, guidelines cannot cover all types of patients and clinical scenarios, and therefore, oral health care professionals should incorporate their own clinical judgment when determining the most appropriate care. ■

BOX 7

What you say to your patient.

Because the American Dental Association Council on Scientific Affairs recommendation published in 2015¹³ provides a clear and actionable statement that was made on the basis of a comprehensive and rigorous systematic review of the evidence that includes patients' values and preferences associated with the outcomes clearly specified, and that seems to be highly protected against the influence of panel members' conflicts of interest, you decide to discuss the recommendation and supplementary data with your patient. You both decide that the patient will not use antibiotic prophylaxis for this procedure. The eTable provides a summary of this recommendation and the critical appraisal conducted.^{12,13}

SUPPLEMENTAL DATA

Supplemental data related to this article can be found at <http://dx.doi.org/10.1016/j.adaj.2015.03.015>.

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eTABLE

Example of critically appraising patient management recommendations from a clinical practice guideline.*

1. Is the clinical recommendation clear and comprehensive?

1a. Is the recommended intervention clear and actionable?	Yes. The recommendation is as follows: "In general, for patients with prosthetic joint implants, prophylactic antibiotics are not recommended prior to dental procedures to prevent prosthetic joint infection." Clinicians would easily understand from this statement that, in most cases, prophylactic antibiotics should not be prescribed to patients.
1b. Is the alternative clear?	Yes. The opposite option is prescribing antibiotic prophylaxis. The ADA guideline panel ¹³ explicitly describes in which exceptional circumstances the alternative approach, providing the antibiotic prophylaxis, could be an option: "For patients with a history of complications associated with their joint replacement surgery who are undergoing dental procedures that include gingival manipulation or mucosal incision, prophylactic antibiotics should only be considered after consultation with the patient and orthopedic surgeon." This information is provided in the remarks of the recommendation and is easily accessible to clinicians.
1c. Were all relevant outcomes important to patients explicitly considered?	Yes. The guideline panel included not only outcomes of effectiveness (for example, prosthetic joint infection) but also outcomes such as antibiotic resistance and adverse events (for example, secondary infections, anaphylaxis, and other allergic reactions, nausea, vomiting, diarrhea)

2. Was the recommendation based on the best current evidence?

Yes. The 2012 AAOS-ADA evidence-based guideline and evidence report provides a detailed description of the systematic review conducted to inform the decision-making process. The methods to identify the available evidence are rigorous and described extensively. However, some limitations are the exclusion of studies published in languages other than English and the lack of any description of the methods used to select and assess the evidence. The 2014 ADA guideline panel¹³ updated the 2012 search.¹² It is likely that the evidence presented to the guideline panel was the best current available evidence.

3. Are patients' values and preferences associated with the outcomes appropriately specified?

No. The conducted systematic review did not explicitly look for studies exploring patients' values and preferences for this recommendation. It is uncertain whether such studies actually exist for this scenario. The guideline panel relied on their own perception of patients' values and preferences about the balance between the scarce evidence on the potential benefits and all the adverse events associated with antibiotic prophylaxis. They clearly state that when formulating the recommendation, they placed a higher value on the potential harms over the limited evidence of benefits.

4. Do the authors indicate the strength of their recommendations?

The ADA guideline panel¹³ provided the following recommendation: "In general, for patients with prosthetic joint implants, prophylactic antibiotics are not recommended prior to dental procedures to prevent prosthetic joint infection." The guideline panel graded the strength of this recommendation as "against," based on a moderate level of certainty.

5. Is the evidence supporting the recommendation easily understood?

5a. For strong recommendations, is the strength appropriate?	Yes. The ADA guideline panel ¹³ assessed the certainty in the evidence as moderate and provided a recommendation against the intervention. The panel also stated that the potential harms outweigh the benefits. The strength seems appropriate.
5b. For weak recommendations, does the information provided facilitate shared decision making?	The strength of the recommendation was graded as strong against the intervention (see 5a); therefore, this question is not applicable to this recommendation.

6. Was the influence of conflict of interests minimized?

In the section "Preventing bias in an AAOS clinical practice guideline," the AAOS panelists¹² explain in detail the process to identify and deal with members of the panel who have conflicts of interest. They also included a methodologist who did not have any conflicts of interest on the panel. The guideline document includes a detailed description of the potential conflicts of interest of all the members of the AAOS working group. The reported conflicts of interests were available and explicitly presented to all members in the panel. All these measures implemented by the guideline development group to minimize the influence of conflict of interest increases the credibility of the recommendation.

Conclusion: The recommendation published in January 2015,¹³ provided by the ADA guideline panel addressing the use of antibiotic prophylaxis to prevent prosthetic joint infection in patients undergoing invasive dental procedures, seems to be appropriately developed and trustworthy.

* Sources: Watters and colleagues¹⁶ and Sollecito and colleagues.¹³