The Journal of Evidence-Based Dental Practice

The Clinical Connection to Evidence and Innovation

Statement of Purpose and Methods

The Journal of Evidence-Based Dental Practice has two primary goals:

- To improve patient outcomes and health
- To facilitate decision making that results in better patient outcomes, enhanced research planning, better products, and improved policy development

By reviewing hundreds of original articles from journals published throughout the world, The Journal of Evidence-Based Dental Practice will provide readers with the best, most current clinical information available—information that will improve the outcomes of clinical procedures.

The Journal of Evidence-Based Dental Practice will advocate the use or rejection of a procedure on the basis of explicit statistical and clinical criteria that will be consistently and rigorously applied to the literature. Recommendations and commentary will be presented with an emphasis on objectivity.

The Journal of Evidence-Based Dental Practice will go beyond the reporting of key findings. Commentaries written by leaders in the field will accompany each article. The purpose of the commentaries is two-fold:

- To clearly describe the article’s relevance to clinical practice
- To provide a simple and understandable explanation of differences between clinical value and statistical significance.

The Journal of Evidence-Based Dental Practice will provide clinicians with the data they need to continuously improve patient outcomes and will serve as a record of valid, objective research for the academician.

Levels of Evidence

The purpose of assigning these grades is to give the reader a better idea of the quality and strength of the study. A lower grade does not necessarily mean the study has less significance. For example, a first-of-its-kind study with a lower grade may be of great significance. The Journal will continue to refine the grading system.

JEBDP Improves Grading System and Adopts Strength of Recommendation Taxonomy Grading (SORT) for Guidelines and Systematic Reviews*

Translation of EB Recommendations

The Journal of Evidence-Based Dental Practice (JEBDP) is adopting the SORT as its method to better evaluate guideline recommendations and the results from systematic reviews1 (Fig. 1).

The quality rating scores for individual studies also changes to a simpler 3-tier grade that deemphasizes observational studies because the evidence from observational studies is normally too weak to support clinical recommendations.

For some years, the standard approach to evaluate the quality of individual studies was based on a hierarchical grading system of research design in which randomized control trials (RCTs) received the highest score. The JEBDP has published many articles and evaluations using these methods. For single clinical trials, the quality grade is still very useful and JEBDP will continue to provide a grade of its analysis of these publications (see later in this article).

The widespread acceptance of good critical appraisal techniques has also drawn attention to the limitations of these evaluation methods in providing guidance for clinical decision making. An important reason to move from just a quality grade to strength of recommendation is that there is no consensus on how to assign a weight to each of the individual study’s major and minor defects. Without this, there is large variation in how evaluators assign a

Of great importance to the JEBDP editors is our commitment to use a grading scale for the strength of recommendation that could be applied more uniformly by reviewers and readers with varying degrees of expertise in evidence-based techniques and clinical epidemiology.

The SORT “grade” is derived from evaluating the evidence from a body of knowledge most often about a single procedure or new product. The strength grades are much more useful to the clinician because they emphasize effectiveness and are intended to provide results that are more applicable to “average” patients. The quality of the evidence on effectiveness is a key component, but not the only component, in making good clinical decisions.

While evidence-based approaches for reviewing clinical research have helped to minimize interpretation bias, methods for connecting that evaluation with clinical recommendations have recently started to appear. Initially, clinical recommendations by evidence-based groups and professional organizations were strongly correlated with the research design of the most important studies. Now for many subjects, there are larger amounts of information available making it also necessary to consider the evidence in its entirety, lending itself to a strength of recommendation grade.

**Strength of Recommendation Taxonomy (SORT)**

The original authors of SORT represent several of the major family medicine journals in the United States (ie, *American Family Physician, Family Medicine, The Journal of Family Practice, Journal of the American Board of Family Practice*, and *BMJ-USA*) and a large family practice academic consortium (Family Practice Inquiries Network [FPIN]).

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*Figure 1. Assigning a Strength-of-Recommendation grade based on a body of evidence. (USPSTF = U.S. Prevention Services Task Force)*

grade on a consistent basis. The “new” system to be used by JEBDP is as follows:

- Is this a key recommendation for clinicians regarding diagnosis or treatment that merits a label?
  - Yes
  - Is the recommendation based on patient-oriented evidence (i.e., an improvement in morbidity, mortality, symptoms, quality of life, or cost)?
    - Yes
    - Is the recommendation based on expert opinion, bench research, a consensus guideline, usual practice, clinical experience, or a case series study?
      - Yes
      - Is the recommendation based on one of the following?
        - Cochrane Review with a clear recommendation
        - USPSTF Grade A recommendation
        - Clinical Evidence rating of Beneficial
        - Consistent findings from at least two good-quality randomized controlled trials or a systematic review/meta-analysis of same
        - Validated clinical decision rule in a relevant population
        - Consistent findings from at least two good-quality diagnostic cohort studies or systematic review/meta-analysis of same
      - Strength of Recommendation = A
    - No
      - Strength of Recommendation = C
  - No
  - Strength of Recommendation not needed
They decided that the proposed taxonomy, or system, for rating the strength of a recommendation should address 3 key elements they identified in an often-quoted Agency for Health Quality Research (AHQR) report.7

- Quality of evidence
- Quantity of evidence
- Consistency of evidence

## THE SYSTEM

The strength of the recommendation is graded either A, B, or C using the criteria in Table 1.

Recommendations based only on improvements in surrogate or disease-oriented outcomes (efficacy) are always categorized as level C. This is because improvements in efficacy are not always associated with improvements in patient-oriented outcomes (effectiveness).8,9

### TABLE 1. Strength-of-Recommendation Grades

<table>
<thead>
<tr>
<th>Strength of recommendation</th>
<th>Basis for recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Consistent, good-quality patient-oriented evidence*</td>
</tr>
<tr>
<td>B</td>
<td>Inconsistent or limited-quality patient-oriented evidence*</td>
</tr>
<tr>
<td>C</td>
<td>Consensus, disease-oriented evidence,* usual practice, expert opinion, or case series for studies of diagnosis, treatment, prevention, or screening</td>
</tr>
</tbody>
</table>

*Patient-oriented evidence measures outcomes that matter to patients: morbidity, mortality, symptom improvement, cost reduction, and quality of life. Disease-oriented evidence measures intermediate, physiologic, or surrogate end points that may or may not reflect improvements in patient outcomes (e.g., blood pressure, blood chemistry, physiologic function, pathologic findings).

### TABLE 2. Assessing Quality of Evidence

<table>
<thead>
<tr>
<th>Study quality</th>
<th>Diagnosis</th>
<th>Treatment/prevention/screening</th>
<th>Prognosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level 1: good-quality, patient-oriented evidence</td>
<td>Validated clinical decision rule SR/meta-analysis of high-quality studies</td>
<td>SR/meta-analysis or RCTs with consistent findings</td>
<td>SR/meta-analysis of good-quality cohort studies</td>
</tr>
<tr>
<td></td>
<td>High-quality diagnostic cohort study*</td>
<td>High-quality individual RCT†</td>
<td>Prospective cohort study with good follow-up</td>
</tr>
<tr>
<td>Level 2: limited-quality patient-oriented evidence</td>
<td>Unvalidated clinical decision rule SR/meta-analysis of lower quality studies or studies with inconsistent findings</td>
<td>SR/meta-analysis of lower quality clinical trials or of studies with inconsistent findings</td>
<td>SR/meta-analysis of lower quality cohort studies or with inconsistent results</td>
</tr>
<tr>
<td></td>
<td>Lower quality diagnostic cohort study or diagnostic case-control study</td>
<td>Lower quality clinical trial Cohort study</td>
<td>Retrospective cohort study or prospective cohort study with poor follow-up</td>
</tr>
<tr>
<td>Level 3: other evidence</td>
<td>Consensus guidelines, extrapolations from bench research, usual practice, opinion, disease-oriented evidence (intermediate or physiologic outcomes only), or case series for studies of diagnosis, treatment, prevention, or screening</td>
<td>Case-control study</td>
<td>Case-control study Case series</td>
</tr>
</tbody>
</table>

SR = systematic review, RCT = randomized controlled trial.

*High-quality diagnostic cohort study: cohort design, adequate size, adequate spectrum of patients, blinding, and a consistent, well-defined reference standard.

†High-quality RCT: allocation concealed, blinding if possible, intention-to-treat analysis, adequate statistical power, adequate follow-up (greater than 80 percent).

‡In an all-or-none study, the treatment causes a dramatic change in outcomes, such as antibiotics for meningitis or surgery for appendicitis, which precludes study in a controlled trial.
The 2 factors used to determine the final SORT grade are
1. the **quality** of the individual studies (Table 2)
2. and the **consistency** of evidence across all the studies being evaluated (Table 3).

**Figure 1** gives information about how to determine the strength of recommendation grade using an algorithm.

- Reviewers **and readers** should adjust the strength of recommendation grade based for an individual patient or circumstance based on the benefits, harms, and costs of the intervention being recommended.

**STUDY QUALITY**

The quality of individual studies is rated levels 1, 2, or 3. Table 2 explains how to determine the level of evidence for an individual study. Once the quality grade is known, it can be “plugged in” to the algorithm in **Figure 1**, along with the consistency grade (Table 3) to yield the final SOR grade. Note that studies about etiology are always given a quality grade of 3 since they represent disease-oriented evidence.

**SUMMARY**

There are several advantages to SORT over other systems:
- It is straightforward and comprehensive
- Is easily applied by reviewers and clinicians
- It explicitly addresses the issue of patient-oriented (effectiveness) versus disease-oriented evidence (efficacy)

SORT strengths also create limitations. Some clinicians may be concerned that the system is not as detailed in its assessment of study designs as others, such as the one previously used by JEBDP, which was adapted from the Center or Evidence-Based Medicine (CEBM). However, SORT authors believe the primary difference between the 2 systems is that the CEBM version also distinguishes between good and poor observational studies whereas the SORT version does not.

JEBDP editors agree with SORT authors in concluding that the advantages of a system that provides the clinician

with a clear recommendation that is strong (A), moderate (B), or weak (C) in its support of a particular intervention outweighs the theoretical benefit of distinguishing between lower quality and higher quality observational studies. JEBDP editors agree with this view because the evidence from observational studies is normally too weak to support clinical recommendations.

Like any such grading scale, SORT is a work in progress and we can expect changes in the future.

**REFERENCES**


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**TABLE 3.** Assessing Consistency of Evidence Across Studies

<table>
<thead>
<tr>
<th>Consistent</th>
<th>Most studies found similar or at least coherent conclusions (coherence means that differences are explainable). or If high-quality and up-to-date systematic reviews or meta-analyses exist, they support the recommendation.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inconsistent</td>
<td>Considerable variation among study findings and lack of coherence or If high-quality and up-to-date systematic reviews or meta-analyses exist, they do not find consistent evidence in favor of the recommendation.</td>
</tr>
</tbody>
</table>