# Academy of Nutrition and Dietetics Methodology for Developing Evidence-Based Nutrition Practice Guidelines

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THE GROWING VOLUME OF health-related research presents a practical challenge for practitioners. It is difficult to stay current with the latest scientific information, and controversy about bias or applicability of research to specific populations will often complicate matters further. Many practitioners recognize the need for current, substantive guidance to provide state-of-the-art care. In line with this trend, the National Academy of Medicine (formerly Institute of Medicine) supports that quality health care must be evidence-based.[1] In the last 20 years, practitioners have moved steadily toward using evidence-based guidelines as blueprints to inform practice and facilitate tailored decision making.[2] Evidence-based guidelines are expected to help busy practitioners locate relevant information rapidly, make a case for the best treatment available, and document the outcomes that third-party payers rely on. Since 2004, the Academy of Nutrition and Dietetics (Academy) has conducted systematic evidence reviews,[3] which are, in turn, used to develop evidence-based nutrition practice guidelines (EBNPGs) as an essential strategy to bridge the gap between research and practice in nutrition care.

EBNPGs are a series of guiding statements that are developed using a systematic process for identifying, analyzing, and synthesizing scientific evidence. They are designed to assist practitioners, primarily registered dietitians nutritionists (RDNs) and nutrition and dietetics technicians, registered (NDTR), in their shared decisions about appropriate nutrition care for specific disease states or conditions in typical settings. Key elements of EBNPGs include:

- scope of the topic;
- interventions and practices considered;
- major recommendations;
- corresponding rating of evidence strength; and
- areas of agreement and disagreement.

The Evidence-Analysis Library (EAL) (www.andeal.org) of the Academy is a user-friendly database dedicated to presenting timely and comprehensive evidence on nutrition care in the form of systematic reviews, EBNPGs, and hands-on resources for guideline implementation. The Academy implements a standardized stepwise process to develop EBNPGs in order to maximize objectivity, transparency, and reproducibility, while minimizing conflict of interest (COI). The aim of this publication was to describe the rigorous method the Academy applies to develop EBNPGs. Also, briefly presented are emerging methodologic directions in the area of effective guideline usage by practitioners.

## GUIDELINE DEVELOPMENT PROCESS

The Academy's Evidence-Based Practice Committee (EBPC) is the oversight committee for all aspects related to the EAL, including appointment of workgroup members, guideline development, and final guideline review.

### Multidisciplinary Team

Each EAL guideline is developed by a multidisciplinary team, also known as an "expert workgroup." The EBNPG team is composed of an Academy staff project manager, a lead analyst, a workgroup chair, approximately 6 to 8 workgroup members, and 4 to 10 evidence analysts. The EBNPG team is responsible for conducting a systematic review that provides the evidence foundation needed to formulate the EBNPG. Qualifications, recruitment, appointment criteria, and roles and responsibilities are described in detail in the Academy's methodology for conducting systematic reviews.[3]

As part of the preparatory stage, before the development of an EBNPG, Academy staff (project manager and lead analyst), in collaboration with the expert workgroup, conduct a needs assessment and evaluation of existing guidelines on the topic under investigation (including other EAL guidelines and/or any external evidence-based guidelines related to the topic). Should this assessment reveal a need to develop a new guideline, then an EBNPG may be developed (Figure 1).

### Determining the Scope of the Guideline Informs the Systematic Review

The scope of the guideline includes the rationale, background, and objectives of the topic and outcomes of interest to practitioners and the targeted population (Figure 1, Step 1). The scope of the guideline is the framework that the workgroup uses to conduct a systematic review (Figure 1, Step 2). In a few words, a systematic review is a comprehensive evaluation of the literature that employs transparent and well-defined procedures. This ensures that the review can be replicated by others and bias is kept at a minimum. In particular, the workgroup determines

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http://dx.doi.org/10.1016/j.jand.2016.07.011

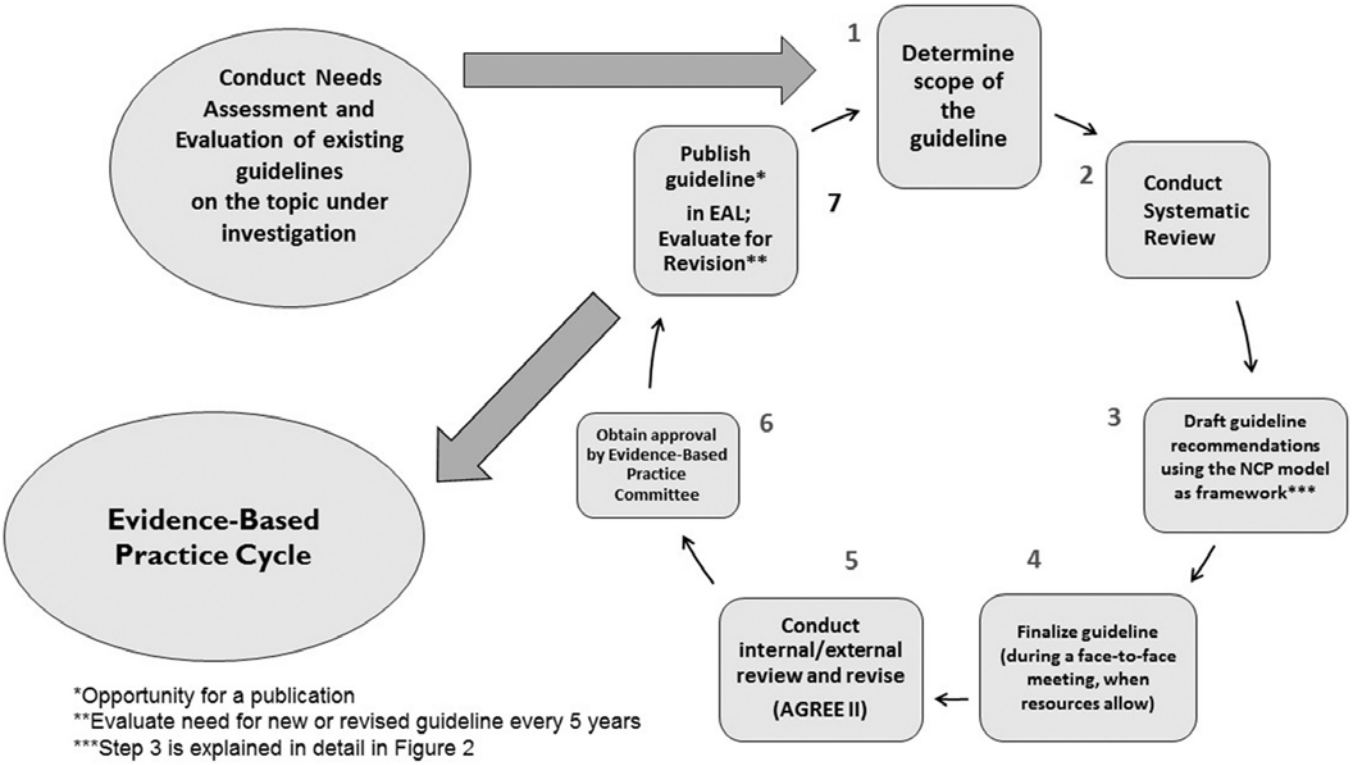


**Figure 1.** Guideline development process.

a collection of systematic review questions that embody the scope of the guideline and are investigated in the literature according to the Academy's methodology on systematic reviews.[3] The findings of the EAL systematic review determine the content of the recommendations that compose the resulting EBNPG.

## Formulating Recommendations

Once the systematic review is complete (Figure 1, Step 2), the lead analyst or project manager writes a draft of the guideline's recommendations (Figure 1, Step 3). This critical step in guideline development consists of a series of inter-connected stages that allow the workgroup to ensure that recommendations are scientifically accurate and well written (Figure 2).

The EAL guideline team strives for recommendations that are clear, specific, and actionable. All recommendations are written in an active voice. Words such as *should* or *strongly recommend* are generally used for strong recommendations, while *may* or *consider* are used for weaker recommendations. The expert workgroup also identifies under which step of the Nutrition Care Process (NCP) the recommendation falls. Determining the step in the NCP helps drive the direction of the recommendation and facilitates use of NCP Terminology (electronic NCP Terminology; https://ncpt.webauthor.com/) when applicable. It is important to emphasize that the overarching framework for both the preceding systematic review and the resulting guideline is the NCP model.[4]

An EAL recommendation is written in two separate statements. The first addresses what the RDN/NDTR should or should not do (action statement). The second explains why the recommendation is appropriate (rationale statement). The rationale can be based on the EAL conclusion statements produced by systematic review, expert opinion, or preexisting guidelines from external organizations.

The majority of EAL recommendations are based on EAL conclusion statements. As part of the systematic review process, EAL conclusion statements are assigned a grade ranging from I to V; if the recommendation is based on an EAL conclusion statement, the conclusion must have a grade of III or better (II or I).[5] A full description of the systematic review grading process can be found in the Academy's systematic review methodology.[3] The grades are summarized in Figure 3.

EAL conclusion statements and recommendations are not necessarily a one-to-one ratio. Multiple recommendations may result from one conclusion statement, or one recommendation may result from more than one conclusion statement.

If a systematic review is not completed in relation to a specific recommendation, or a systematic review results in a grade V assignment (no evidence available), the expert workgroup may develop a recommendation based on expert opinion. Recommendations based on expert opinion are supported by one or more credible resources (eg, position papers, standards of practice, consensus reports, articles from peer-reviewed journals, other guidelines, nationally recognized documents, or websites) and are rated as "consensus." Credible resources used for the development of consensus recommendations do not require approval by the EBPC.

In some instances, an expert workgroup may identify an external

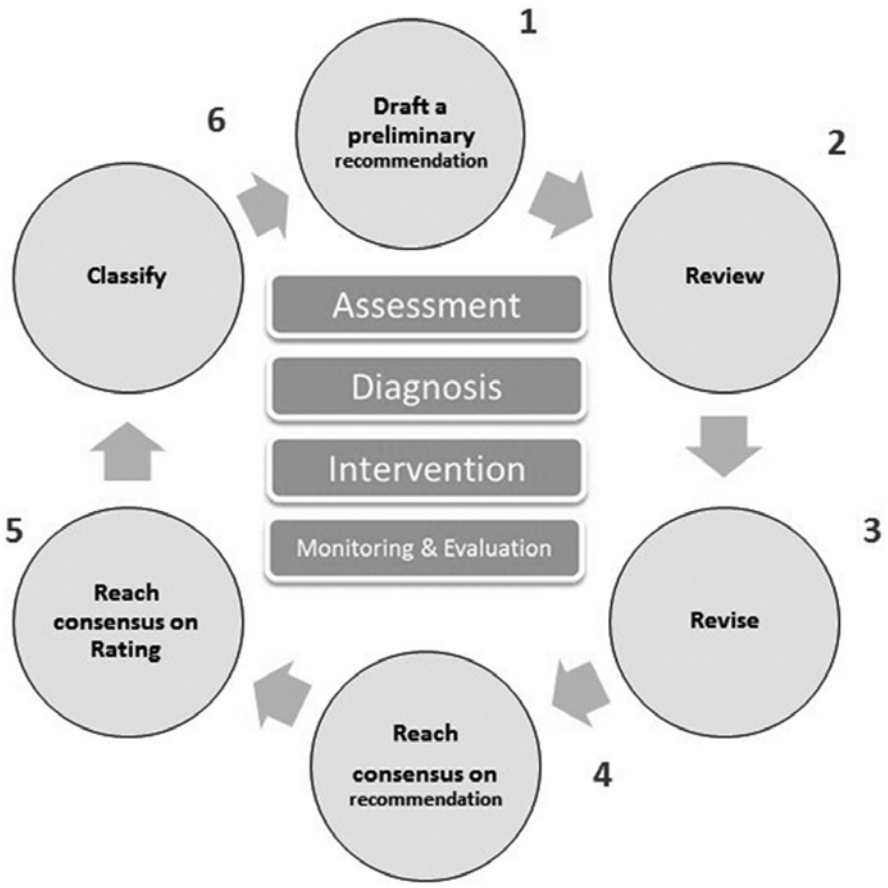


**Figure 2.** Step 3 of guideline development: Writing phase of guideline recommendations using the Nutrition Care Process model as framework.

guideline (ie, a guideline published by a source other than the Academy) that they wish to incorporate into the EAL guideline. Incorporation of external guidelines provides several benefits. The external guideline may strengthen or broaden the EAL guideline, prevent duplication of efforts, save resources for new nutrition-related systematic reviews, and may align Academy guidelines with those of other organizations when appropriate. The methodology of external guidelines must be approved by the EBPC before incorporation. The project manager or lead analyst is responsible for providing the EBPC with a summary of the external guideline's methodology (Figure 4). The external guideline is assessed to ensure it meets criteria adapted from the National Guidelines Clearinghouse Criteria for Inclusion of Clinical Practice Guidelines.[6] The EBPC reviews the summary, determines whether the methodology meets criteria, and considers approval. Recommendations from external guidelines that receive EBPC approval are then incorporated into the EAL guideline.

## Rating and Classifying Recommendations

Once the wording of a recommendation is approved by the consensus of the expert workgroup, the workgroup rates and classifies the recommendation. When rating recommendations based on an EAL systematic review conclusion statements with a grade III or better, the workgroup uses the "Rating Scheme for the Strength of the Recommendation" developed by the Academy (Figure 5).[7] Key factors in rating recommendations are determination of benefit vs harm and strength of supporting evidence. In order for a recommendation to be rated "strong" or "fair," the benefit must clearly outweigh the harm. The difference between a "strong" and "fair" rating is the strength of the supporting evidence. A "weak" rating represents little clear advantage of one approach vs another, or questionable supporting evidence. A "consensus" rating is based on expert opinion and requires a supporting reference, such as a meta-analysis from a peer-reviewed journal. If evidence is available and results in a conclusion statement with a grade III or better, a consensus recommendation is not written, although there are exceptions at times due to very limited data. Recommendations rated as "insufficient evidence" indicate an unclear balance between benefit and harm, and/or absence of evidence. "Insufficient evidence" recommendations are not written frequently because they do not guide the practitioner with a clear course of action.

When rating recommendations from EBPC-approved external guidelines, the expert workgroup uses the same recommendation rating scale (Strong, Fair, Weak, or Insufficient Evidence). In lieu of rating the strength of a systematic review, the expert workgroup uses the rating of the external guideline. In some instances, there may not be a clear correlation between the external guideline rating and the EAL rating scale. In this case, the expert workgroup develops a rating equivalency scheme, which is brought to the EBPC for approval.

Once a recommendation is rated, the workgroup classifies the recommendation as either "imperative" (applies to all members of the specified guideline population generally) or "conditional" (applies only under certain circumstances).

All evidence and systematic review material used to develop guidelines is available to the workgroup through an online portal. During bimonthly teleconferences, workgroups review, revise, and reach consensus on recommendation wording, rating, and classification. Sometimes recommendations are combined or re-organized later, so often the first draft of a recommendation is very different at the end. A consensus on a recommendation's direction, wording, or rating requires the approval of a majority of the expert workgroup. In the event that one or more workgroup members disagree with the direction and/or rating of a recommendation, this is identified in the "Minority Opinion" section of the recommendation template.

## EXTERNAL REVIEW

Once workgroup consensus is reached, an interdisciplinary group of 8 to 10

| Strength of evidence elements | Grade | | | | |
|---|---|---|---|---|---|
| | I<br>Good/strong | II<br>Fair | III<br>Limited/weak | IV<br>Expert opinion only | V<br>Grade not assignable |
| **Quality**<br>Scientific rigor/validity<br>Considers design and execution | Studies of strong design for question<br>Free from design flaws, bias, and execution problems | Studies of strong design for question with minor methodologic concerns<br>OR<br>Only studies of weaker study design for question | Studies of weak design for answering the question<br>OR<br>Inconclusive findings due to design flaws, bias, or execution problems | No studies available<br>Conclusion based on usual practice, expert consensus, clinical experience, opinion, or extrapolation from basic research | No evidence that pertains to question being addressed |
| **Consistency**<br>Findings across studies | Findings generally consistent in direction and size of effect or degree of association, and statistical significance with minor exceptions at most | Inconsistency among results of studies with strong design<br>OR<br>Consistency with minor exceptions across studies of weaker design | Unexplained inconsistency among results from different studies<br>OR<br>Single study unconfirmed by other studies | Conclusion supported solely by statements of informed nutrition or medical commentators | Not available |
| **Quantity**<br>Number of studies<br>Number of subjects in studies | One to several good-quality studies<br>Large number of subjects studied<br>Studies with negative results have sufficiently large sample size for adequate statistical power | Several studies by independent investigators<br>Doubts about adequacy of sample size to avoid Type I and Type II error | Limited number of studies<br>Low number of subjects studied and/or inadequate sample size within studies | Unsubstantiated by published research studies | Relevant studies have not been done |
| **Clinical impact**<br>Importance of studied outcomes<br>Magnitude or effect | Studied outcome relates directly to the question<br>Size of effect is clinically meaningful<br>Significant (statistical) difference is large | Some doubt about the statistical or clinical significance of the effect | Studied outcome is an intermediate outcome or surrogate for the true outcome of interest<br>OR<br>Size of effect is small or lacks statistical and/or clinical significance | Objective data unavailable | Indicates area for future research |

*(continued on next page)*

**Figure 3.** Criteria and definitions for grading the strength of the evidence for an Evidence Analysis Library Conclusion Statement, data adapted by the Academy of Nutrition and Dietetics.[5]

| Strength of evidence elements | Grade | | | | |
|---|---|---|---|---|---|
| | I Good/strong | II Fair | III Limited/weak | IV Expert opinion only | V Grade not assignable |
| **Generalizability** To population or interest | Studied population, intervention, and outcomes are free from serious doubts about generalizability | Minor doubts about generalizability | Serious doubts about generalizability due to narrow or different study population, intervention, or outcomes studied | Generalizability limited to scope of experience | Not available |

**Figure 3.** *(continued)* Criteria and definitions for grading the strength of the evidence for an Evidence Analysis Library Conclusion Statement, data adapted by the Academy of Nutrition and Dietetics.[5]

expert reviewers with interest and knowledge in the guideline topic area are recruited by Academy staff for external review of an EBNPG. Disciplines include but are not limited to RDNs, physicians, nurses, pharmacists, and psychologists. Expert external reviewers may or may not be Academy members.

### Guideline Review Process

When resources allow, the workgroup meets in a face-to-face meeting for review, revision, and approval of developed guideline materials (Figure 1, Step 4).

Upon completion of the EBNPG, electronic access is granted to the appointed external reviewers to conduct an evaluation of the guideline over a 2- to 3-week period (Figure 1, Step 5). The evaluation survey is an adaptation of the Appraisal of Guidelines Research and Evaluation II instrument (AGREE II).[8] The workgroup thoroughly considers the survey results that are blinded to the workgroup throughout the review, and either makes revisions as suggested, or declines with documented justification. Revisions and responses to external reviewers' comments are documented by Academy staff and presented to the Guideline Review Subcommittee of the EBPC. The subcommittee reviews the aforementioned materials and either provides suggested revisions to the workgroup or sends them to the EBPC for consideration of approval and publication on the EAL (Figure 1, Step 6). The EBPC votes on approval of guidelines during monthly teleconferences. The names and credentials of each guideline reviewer are listed under "Project Team" on the EAL project landing page. As part of the guideline review process, the EBPC ensures that external reviewers' comments have been addressed adequately; once the EBNPG is approved by the EBPC, it is published on the EAL website, where members can access the EBNPG (Figure 1, Step 7).

### Revision

EBNPGs are revisited every 5 years. A review of literature is conducted to assess advancements in research, and changes in interventions since publication of the available EBNPG. When an update is released, previous guidelines on the same topic continue to remain available on the EAL. As each update includes its year of release, users can readily identify newer and previous versions of guidelines. Also, a guideline comparison table is made available, so it is easy for users to identify which recommendation is updated, or new, or not reviewed, or remained unchanged.

### Research Gaps

All questions in the systematic review that could not be answered due to lack of available literature are given a grade V (Figure 4). Grade V conclusion statements generally include a specific statement about need for further research. Grade V conclusion statements can be found within the systematic review projects on the EAL and also in a separate section of the EAL titled "Research Gaps." In recent EBNPGs, the overview (introduction) includes a section describing "Future Research Needs" that were identified.

## GUIDELINE COMPONENTS

### Recommendation Template

Each finished recommendation is accompanied by a number of components, which will be explained. They are designed to provide the practitioner with additional information to aid in implementation. These components frame the intended population and setting, and potential harms, benefits, and costs for the practitioner to consider when implementing the recommendation. The workgroup may draw upon clinical experience and/or support by literature when formulating the first three components (ie, conditions, risks/harms, and costs).

The recommendation template includes the following components.

**Risks/Harms of Implementing the Recommendation.** Any potential risks, anticipated harms, or adverse consequences that might be associated with implementing the recommendation are identified and described. For example, when recommending potassium supplements for adults with hypertension, the appropriate contraindication is explicitly described for those adults taking certain medications, such as potassium-sparing diuretics due to increased risk for hyperkalemia.

**Conditions of Application.** Any conditions that can limit the application of the recommendation are specified. All patient/client, professional, political, economic, social, and organizational/practical barriers, such as lack of counseling space in an outpatient setting, are

| Academy Criteria for using guidelines in Evidence Analysis Library | Meets criteria (check if meets criteria, note if does not) | Documentation in guideline methodology |
|---|---|---|
| Produced under appropriate organization type (relevant professional society) | | |
| **Includes systematic review, which involves:** | | |
| Determining the problem and formulating into a question | | |
| Gathering and selecting relevant evidence | | |
| Synthesizing and grading the evidence | | |
| Formulating recommendations using the best available evidence | | |
| Disseminating the findings | | |
| Most recent version produced | | |
| Safeguards to ensure funding did not affect the process | | |

**Figure 4.** Summary Tool for the Evaluation of External Guideline Methodology, Academy of Nutrition and Dietetics. Data from the National Guideline Clearinghouse.[6]

considered. Recommendations classified as "imperative" may have some general conditions for application. Recommendations classified as "conditional" will always have conditions specified, such as setting or population.

**Potential Costs Associated with Application (Resources Implications).** If any potential client/patient, professional, or organizational costs are associated with implementation of the recommendation, they are identified and described. These costs may include need for specialized new staff, equipment, or treatments.

**Recommendation Narrative.** A brief description of the evidence for each recommendation is provided. For recommendations drawn from EAL systematic reviews, the number of studies, quality ratings, and bullet points that capture main ideas from the evidence summary are included. For those based on consensus statements and/or external guidelines, there is a narrative summary that highlights the key components from the cited sources.

**Recommendation Strength Rationale.** The rationale for each recommendation rating is provided. For EAL systematic reviews, a brief list of the supporting evidence strengths and methodological issues that determined the rating of the recommendation is included. For any included relevant consensus statements and/or recommendations based on external guidelines, rationale such as concurrence from the workgroup on use of the cited sources or an external organization's assigned rating of the resource is provided.

**Minority Opinions.** Any minority opinions during the writing and rating of the recommendation are documented under each recommendation. If there are no minority opinions, "none" is indicated.

**Supporting Evidence.** Recommendations include links to their related EAL systematic reviews. The Supporting Evidence section may include one or more of the following components:

- *Evidence analysis:* If the recommendation is supported by an EAL systematic review, the evidence analysis question(s) is/are linked. This link provides all systematic review evidence (conclusion statement, evidence summary, search plan, and results).
- *References:* All citations used in a related EAL systematic review are cited under each recommendation. For each recommendation that is supported by an EAL systematic review, the related data extraction sheets for each included study are linked. Recommendations supported by credible resources (consensus) and external guidelines are not included under the supporting evidence heading.
- *References not graded in Academy of Nutrition and Dietetics Evidence Analysis Process:* These references may be included in the EAL systematic review, but must be included whenever consensus statements and external guideline recommendations are incorporated in recommendations. Hence, all references used in the development of the guideline that were not used in the systematic review are referenced under this heading in EAL. This includes references used in consensus recommendations and external guidelines approved by the EBPC. This section also includes all references used to complete the template, such as sources used to identify potential cost associated with a recommendation.

## GUIDELINE FORMAT

EAL guidelines can be navigated via the table of contents, which includes the following five major components (Figure 6):

1. *Executive Summary of Recommendations:* provides a list of all of the recommendations and ratings within a guideline, and is organized by the NCP. This section is available as a downloadable pdf document.
2. *Guideline Introduction:* includes the guideline overview and development, topics addressed, and any approved external guidelines.

| Statement rating | Definition | Implication for practice |
|---|---|---|
| **Strong** | A **Strong** recommendation means that the workgroup believes that the benefits of the recommended approach clearly exceed the harms (or that the harms clearly exceed the benefits in the case of a strong negative recommendation), and that the quality of the supporting evidence is excellent/good (grade I or II).[a] In some clearly identified circumstances, strong recommendations may be made based on lesser evidence when high-quality evidence is impossible to obtain and the anticipated benefits strongly outweigh the harms. | Practitioners should follow a **Strong** recommendation unless a clear and compelling rationale for an alternative approach is present. |
| **Fair** | A **Fair** recommendation means that the workgroup believes that the benefits exceed the harms (or that the harms clearly exceed the benefits in the case of a negative recommendation), but the quality of evidence is not as strong (grade II or III).[a] In some clearly identified circumstances, recommendations may be made based on lesser evidence when high-quality evidence is impossible to obtain and the anticipated benefits outweigh the harms. | Practitioners should generally follow a **Fair** recommendation but remain alert to new information and be sensitive to patient preferences. |
| **Weak** | A **Weak** recommendation means that the quality of evidence that exists is suspect or that well-done studies (grade I, II, or III)[a] show little clear advantage to one approach vs another. | Practitioners should be cautious in deciding whether to follow a recommendation classified as **Weak**, and should exercise judgment and be alert to emerging publications that report evidence. Patient preference should have a substantial influencing role. |
| **Consensus** | A **Consensus** recommendation means that Expert opinion (grade IV) supports the guideline recommendation even though the available scientific evidence did not present consistent results, or controlled trials were lacking. | Practitioners should be flexible in deciding whether to follow a recommendation classified as **Consensus,** although they may set boundaries on alternatives. Patient preference should have a substantial influencing role. |
| **Insufficient Evidence** | An **Insufficient Evidence** recommendation means that there is both a lack of pertinent evidence (grade V)[a] and/or an unclear balance between benefits and harms. | Practitioners should feel little constraint in deciding whether to follow a recommendation labeled as **Insufficient Evidence** and should exercise judgment and be alert to emerging publications that report evidence that clarifies the balance of benefit vs harm. Patient preference should have a substantial influencing role. |
| [a]See Figure 3 for definitions of grades. | | |

**Figure 5.** Rating Scheme for the Strength of the Recommendations, Academy of Nutrition and Dietetics. Data from the American Academy of Pediatrics.[7]

3. *Scope*: provides the purpose, guideline category, clinical specialties, intended users, objectives, target population, interventions and practices considered (NCP). The scope is divided into several subsections:
   - Statement of Intent: each EAL guideline includes a statement that describes the intended audience, the overarching purpose of EBNPGs, and the role of the patient and family preference.

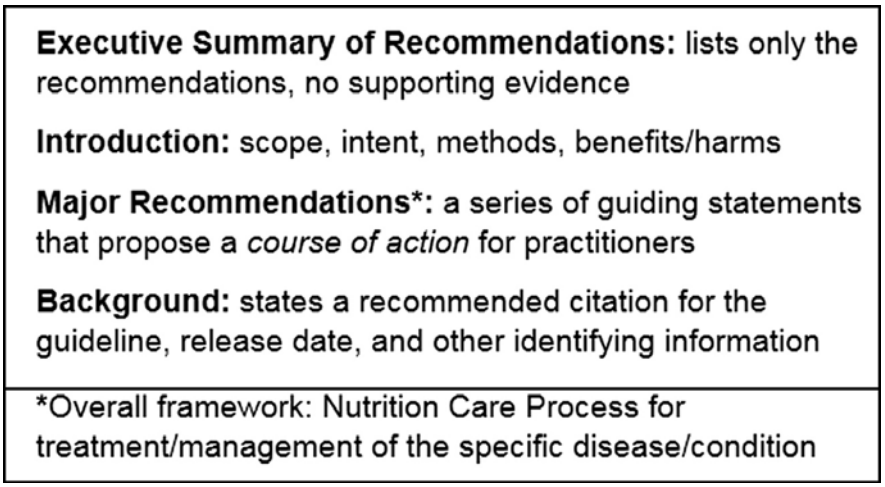


**Figure 6.** Components of guidelines.

- General Methods: provides an overview of the EAL systematic review and guideline development process.
- Specific Methods: provides links to search plans and results for each EAL systematic review. The search plans include the date of literature searches, inclusion and exclusion criteria, search terms, databases searched, and the list of included and excluded articles.
- Implementation: provides strategies for guideline dissemination, and suggestions for distribution and implementation.
- Benefits and risks/harms of implementation: describes general risks and harms associated with implementation of EBNPGs.

4. *Major Recommendations:* includes a list of recommendation topics, organized by the NCP. A link is provided for each recommendation topic, which may contain as many as four recommendations.
5. *Background Information:* a recommended citation for the guideline, release date, guideline developer, guideline availability, and a copyright statement is provided.

## FUNDING AND COI

### Funding

The Academy is the primary source of funding for EBNPGs. Guidelines do not receive industry funding. Also, any EAL systematic review that is funded by industry is not incorporated into an EBNPG. Government agencies, nonprofit foundations, and professional associations may be considered for funding EAL EBNPGs. Regardless of funding source, the expert workgroup has complete autonomy of the systematic review and guideline.

### Identifying and Managing COI

All systematic review and guideline team members are required to disclose all potential COI. COI forms are kept up to date via an online format provided by the Academy. Expert workgroup members are required to verbally disclose potential COI at the beginning of each workgroup meeting. All potential COI is managed by Academy staff and the workgroup chair. In some instances, an expert workgroup member may need to withdraw from the discussion to prevent COI. To ensure transparency, all expert workgroup members' COI information is published on the EAL.

## DISSEMINATION

Dissemination efforts are an integral part of reducing the gap between research and practice. EBNPGs are published on the EAL website and are accessible by Academy members and subscribers of the EAL. Guidelines are also available in a mobile app format, the NutriGuides. EAL staff, in coordination with the Academy's marketing department and social media manager, disseminate information via all applicable channels including but not limited to Academy social media, newsletters to Dietetic Practice Groups, EatRight weekly, and ads in the *Journal of the Academy of Nutrition and Dietetics*. Guideline workgroup members, in collaboration with EAL scientists, develop dissemination sessions at Food & Nutrition Conference & Expo every year. International conferences, such as the International Confederation of Dietetic Associations Congress, are actively pursued for dissemination sessions and networking. Each EBNPG presents an opportunity for peer-reviewed articles. According to an EBPC policy, each EAL systematic review and/or guideline will lead to a related scientific manuscript published in a peer-reviewed journal for further dissemination. EBNPGs are also published by the Agency for Healthcare Research and Quality's National Guideline Clearinghouse (http://www.guideline.gov), which is a searchable web-based database. The Academy is a member organization of the Guidelines International Network (G-I-N), a global network comprising 99 organizations and 49 countries aiming to support collaboration and advancements in guideline development (http://www.g-i-n.net/). G-I-N publishes the Academy's EBNPGs in its web-based International Guideline Library as a means to promote best practice.

## IMPLEMENTATION

The EBNPG is built upon the evidence base of the EAL systematic review. To assist practitioners with application, the Academy develops toolkits for the majority of its EBNPGs (Figure 7). Toolkits are typically authored by two to three selected workgroup members with extensive practitioner experience. Selected authors revise developed templates that have been approved by the EBPC. The templates include medical nutrition therapy flowcharts, progress notes, follow-up notes, and referral forms. Toolkits also include an executive summary of recommendations, case studies, patient/client education, a list of resources for practitioners, and an outcomes collection spreadsheet. Before publication, EBNPG toolkits are tested for usability by recruited volunteers. Reviewer responses and author revisions and responses are documented by EAL staff and presented to

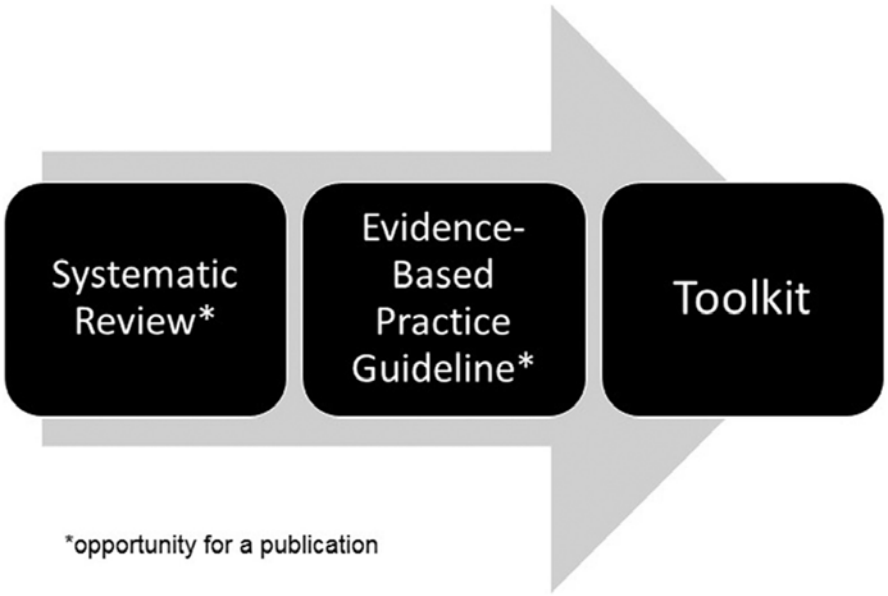


**Figure 7.** Evidence-based nutrition practice: Evidence Analysis Library process.

the EBPC for consideration of approval. Toolkits approved by the EBPC are made available for purchase.

Toolkits are currently undergoing revision to better meet the needs of today's practitioners. Moving forward, toolkits will provide guideline implementation tools to further improve practitioners understanding of recommendations, assist in implementation at their facility, and promote outcomes collection by linking to information technologies, such as the Academy of Nutrition and Dietetics Health Informatics Infrastructure.[9] The new toolkit format under consideration is intended to increase implementation and allow longitudinal monitoring of EBNPG applications.

## Emerging Methodologic Directions

According to the 2012 Academy Needs Satisfaction Survey, the EAL and its products are reported as a high-value member benefit.[10] Such data indicate that RDNs acknowledge the importance of evidence-based practice. However, research in the implementation of nutrition guidelines reveals an important evidence-practice gap.[11-13] Less-than-desirable or delayed implementation of evidence-based practice is a ubiquitous problem in various health care specialties.[14] Several barriers have been reported, such as poor dissemination techniques, conflicting guidelines on the same topic, professionals' perceptions that guidelines are rigid and do not take into account personal client/patient circumstances, and limited practitioner education and training on evidence-based practice.[14,15] Also, practitioners can report that they engage in evidence-based practice, but when assessed using objective measures, their knowledge and use of guidelines do not correlate well with self-report.[16] This barrier has been called *sense of competence*[17] and can have undesirable consequences. Practitioners with a sense of competence may ignore conventional means of dissemination and implementation, which interferes with or delays effective uptake of EBNPGs.[16] In light of these findings, novel strategies are needed to better support practitioners to implement EBNPGS seamlessly from educational to professional environments. These can include general requirements embedded in continuing professional education and/or tailored interventions in different areas of education and practice. Even though comparisons between delivered care and impact of guideline application are a new area of translational research, the data are promising. For example, the implementation of standardized nutrition guidelines by renal RDNs was associated with improved nutrition status.[18] The Academy has been working to develop a method that evaluates the adherence to EBNPGs.[19-22] The core concept under exploration is that an EBNPG is adequately implemented if a linked set of concise comparative standards are met. A comparative standard is satisfied when expert predefined queries (based on recommendation content) are positively identified upon examination of documented practice data.[21,22] This set of linked standards has been named "NCP Chains" and parallels the Academy's four-step NCP model (assessment, nutrition diagnosis, nutrition intervention, and evaluation).[4] The NCP Chains cultivate the type of critical thinking and reasoning required to complete the interconnected steps of NCP. By consequence, alignment with the NCP Chains may serve as tangible evidence of EBNPG application in practice.[19,20] Should NCP Chains become part of educational curricula, supervised practice experiences, practice settings, and provided resource materials like toolkits, the future opportunities to objectively measure application of EBNPGs will be greatly enhanced.

## GUIDELINES ARE A KEY COMPONENT OF THE EVIDENCE-BASED PRACTICE CYCLE

Evidence-based practice is much more than practice based on evidence. It integrates a systematic process that evaluates the applicable body of evidence and recommends ways to implement the weight of the evidence in health care settings. The Academy, through its commitment to developing current systematic reviews and EBNPGs, is a leader in evidence-based practice.

EBNPGs are an essential resource for the implementation of evidence-based practice. The evidence summaries and conclusion statements of the systematic review describe what the evidence says and the resulting EBNPG explains how the practitioner may apply available evidence in practice. Each recommendation statement in an EBNPG outlines for the practitioner an evidence-based course of action (what to do) and the rationale (why), including a rating and a classification. EBNPGs are an important means to apply the Nutrition Care Process and Terminology as each EBNPG is framed using the NCP model. This approach promotes consistency in


**Figure 8.** Objectives of evidence-based nutrition practice guidelines.

practice, supports achieving expected outcomes, and assures quality of practice (Figure 8). The EBNPGs are a very important component of the Evidence-Based Practice Cycle because they link research with practice (Figure 9). Practice that is streamlined by effective implementation of EBNPGs allows for collaborative outcomes research using electronic NCP Terminology/Academy of Nutrition and Dietetics Health Informatics Infrastructure to continuously improve the effectiveness of EBNPGs. As the Evidence-Based Practice Cycle shows, improvement is an ongoing process; hence, several EBNPGs have been updated since their first release. Also, EBNPGs are a state-of-the-art resource that are used to inform the Nutrition Care Manual, an electronic collection of nutrition therapy interventions and professional practice manuals in different areas of practice (https://www.nutritioncaremanual.org/), and the Academy's Position (http://www.eatright.org/positions/) and Practice Papers. (http://www.eatright.org/members/practicepapers/).

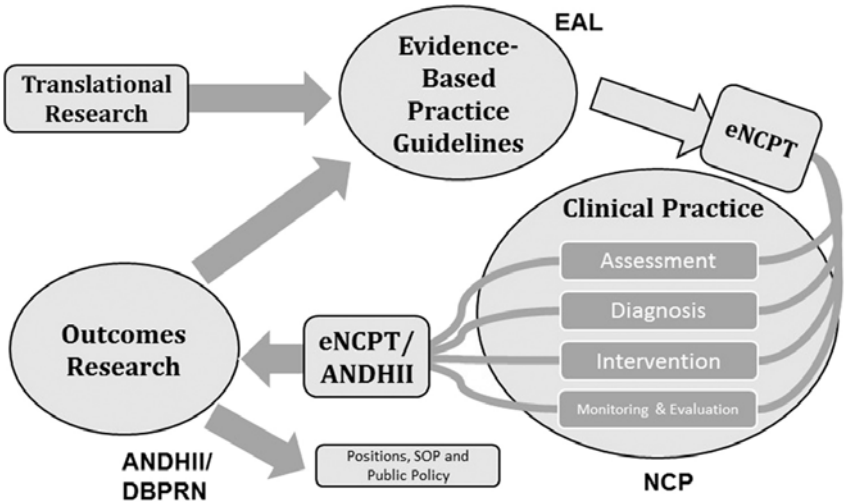


**Figure 9.** Completing the evidence-based practice cycle: research with practice. ANDHII=Academy of Nutrition and Dietetics Health Informatics Infrastructure; DPBRN=Dietetics Practice Based Research Network; EAL=Evidence Analysis Library; eNCPT=electronic Nutrition Care Process Terminology (formerly IDNT [International Dietetics & Nutrition Terminology]); NCP=Nutrition Care Process; SOP=Standards of Practice.

## COLLABORATIVE INITIATIVES IN GUIDELINE DEVELOPMENT

EBNPGs are major undertakings that have a high demand for resources and infrastructure. Guidelines on various health care topics are ubiquitous within the United States and beyond, and there is an increasing demand for standards to streamline their development and appraisal. A way to reduce duplication or overlapping guidelines, uphold high-quality standards, and scale up dissemination and implementation efforts is through inter-agency and/or international partnerships. The Academy has already begun to work in this direction by collaborating with expert health care agencies and international workgroup members on ongoing projects. This not only fosters interdisciplinary teamwork whenever relevant, but increases the reach of EBNPGs. Still, the composition of the guideline workgroup extends beyond a balanced mix of professional experts. The National Academy of Medicine has recommended that a guideline development workgroup include representatives of populations expected to be affected by the developed guidelines.[2] To this end, the Academy is pilot-testing the active participation of patient advocates and/or patient organization representatives in ongoing guideline projects.

## CONCLUSIONS

This article describes the rigorous and transparent multi-step process that the EAL applies to develop EBNPGs. EBNPGs include a collection of evidence-based recommendations on nutrition therapy, nutrient, food, or nutrition-related topics that inform practitioners, primarily RDNs and NDTRs, but other members of the health care team may find them helpful. EBNPGs are available

on the EAL website. Guidelines developed by EAL are also included on the websites of the National Guideline Clearinghouse and G-I-N, the world's largest international guideline library. The Academy is intensely focused on enhancing collaborations with organizations and experts, and exploring novel methods to enhance dissemination and implementation of EBNPGs. The potential of EBNPGs will be more fully realized as guidelines are consistently applied to conduct outcomes-related research in the field.

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### STATEMENT OF POTENTIAL CONFLICT OF INTEREST

No potential conflict of interest was reported by the authors.

### FUNDING/SUPPORT

There is no funding to disclose.