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# Chronic Obstructive Pulmonary Disease

## COPD: Introduction (2019)

### Guideline Overview

#### Guideline Title

Chronic Obstructive Pulmonary Disease (2019) Evidence-Based Nutrition Practice Guideline

#### Guideline Narrative Overview

The focus of this guideline is on medical nutrition therapy (MNT) for people with chronic obstructive pulmonary disease (COPD).

COPD is a leading cause of death in both the United States and world-wide.<sup>1,2</sup> COPD is described by the American Thoracic Society as a slowly progressive lung disease that is characterized by airflow limitation and obstruction.<sup>3</sup>

Although COPD affects the lungs, it also produces significant systemic consequences. Adults who are diagnosed with COPD often have other comorbidities and especially in the elderly are particularly vulnerable to the effects of smoking, poor diet and inactivity.<sup>2</sup> COPD may be accompanied by weight loss, nutritional abnormalities and loss of skeletal muscle and/or function.<sup>2</sup>

The primary goals of MNT for people with COPD are to achieve and maintain appropriate body weight and composition, maximize pulmonary status, reduce mortality, and improve quality of life (QOL).

#### References

<sup>1</sup>Mortality in the United States, 2016. National Center for Health Statistics. Centers for Disease Control and Prevention. NCHS Data Brief No. 293, December 2017. Accessed Jul 1, 2019: <https://www.cdc.gov/nchs/products/databriefs/db293.htm>

<sup>2</sup>Global Strategy for the Diagnosis, management and Prevention of Chronic Obstructive Pulmonary Disease (2019 Report). Global Initiative for Chronic Lung Disease. Accessed Jul 1, 2019: <https://goldcopd.org/wp-content/uploads/2018/11/GOLD-2019-v1.7-FINAL-14Nov2018-WMS.pdf>

<sup>3</sup>Qaseem A, Wilt TJ, Weinberger SE, Hanania NA, Criner G, van der Molen T, Marciniuk DD, Denberg T, Schunemann H, Wedzicha W, MacDonald R, Shekelle P, for the American College of Physicians, the American College of Chest Physicians, the American Thoracic Society, and the European Respiratory Society. Diagnosis and Management of Stable Chronic Obstructive Pulmonary Disease: A Clinical Practice Guideline Update from the American College of Physicians, American College of Chest Physicians, American Thoracic Society, and European Respiratory Society. *Ann Intern Med.* 2011; 155: 179-191.

#### Guideline Development

This guideline is intended for use by Registered Dietitian Nutritionists (RDNs) involved in providing MNT to adults with COPD. The recommendations in this guideline were based upon a systematic review of the literature and the work performed by the Academy of Nutrition and Dietetics Expert Work Group on COPD.

To view the guideline development and review process, see Guideline Methods.

The recommendations provide a framework for the RDN to successfully integrate MNT into the overall medical management of adults with COPD.

Topics include:

- Medical nutrition therapy
- Predictive equations for estimating energy requirements
- Macronutrient composition (percent distribution)
- Energy intake
- Vitamin D supplementation
- Serum 25(OH)D levels
- Body weight

#### Contributors

Expand the Project Team to see the list of expert workgroup members, analysts, and contributors for this project.

#### Medical Nutrition Therapy and Chronic Obstructive Pulmonary Disease

Scientific evidence supports the effectiveness of MNT to increase effectiveness of therapy for COPD.

#### Medical Nutrition Therapy and COPD

Scientific evidence supports the importance of the RDN providing MNT to adults with COPD and is integral to the interdisciplinary health care team caring for COPD patients. The RDN designs and implements the optimal nutrition care plan and prescription that complements physical activity and pharmacologic therapy, if needed. Based on the patient's clinical status, plan for treatment, and comorbidities, the RDN monitors and evaluates the effectiveness of the nutrition care plan in promoting the patient's nutrition and health outcomes. The RDN adjusts the nutrition care plan as necessary to achieve desired outcomes.

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# Chronic Obstructive Pulmonary Disease

## COPD: Scope of Guideline (2019)

### Guideline Scope Characteristics

Below you will find a list of characteristics that describe the Scope of this Guideline.

#### Disease/Condition(s)

##### Populations to Whom This Guideline May Apply

This guideline applies to adults with COPD.

## Other Guideline Overview Material

For more details on the guideline components, use the links in the left navigation bar:

- Scope of Guideline
- Statement of Intent
- Guideline Methods
- Implementation of the Guideline
- Benefits and Harms of Implementing the Recommendations

## Contraindications

This guideline was developed for adults in all stages of COPD, regardless of source of diagnosis and for individuals in all settings, except critical care. While individuals with COPD with and without comorbid conditions were included in the research, careful consideration should be given to the application of these guidelines for patients with significant medical co-morbidities. Clinical judgement is crucial in the application of these guidelines.

This guideline is not intended:

- For prevention of COPD in individuals without COPD.
- For individuals with COPD who are on mechanical ventilation.
- For individuals with other pulmonary diagnoses, such as asthma, pulmonary hypertension, interstitial lung disease, and Asthma-COPD Overlap Syndrome.
- For interventions typically within the scope of practice of a certified exercise physiologist or athletic trainer, or other professional, for which, adequate training in physical activity interventions is necessary.
- As a replacement for interventions typically within the scope of practice of behavioral or psychological professional, for which adequate training in behavioral therapy is necessary.
- The reader may explore other EAL Guidelines such as Critical Illness, Diabetes 1 and 2, Adult Weight Management, Hypertension or systematic review projects, such as Adult Nutrition Screening for further information on treatment beyond this guideline.

## Guideline Category

Assessment of Therapeutic Effectiveness, Counseling, Evaluation, Management, Treatment

## Clinical Specialty

Allergy and Immunology, Cardiology, Family Practice, Geriatrics, Internal Medicine, Nutrition, Pulmonary Medicine, Thoracic Surgery

## Intended Users

Registered Dietitians, Advanced Practice Nurses, Health Care Providers, Nurses, Patients, Pharmacists, Physician Assistants, Physicians, Respiratory Care Practitioners, Students

## Guideline Objective(s)

### Guideline Objective(s)

- To provide evidence-based MNT recommendations for adults with COPD that assist in achieving and maintaining optimal weight and improved QOL.

### Specific Objectives

- To define evidence-based COPD nutrition recommendations for RDNs that may be carried out in collaboration with other healthcare providers
- To guide practice decisions that integrate medical, nutritional and lifestyle strategies
- To reduce variations in practice among RDNs and other health professionals who may use these guidelines
- To provide the RDN with data to make recommendations to adjust MNT or recommend other therapies to achieve desired outcomes
- To enhance the QOL for the adult with COPD, utilizing customized strategies based on the individual's preferences, lifestyle and goals
- To develop content for intervention that can be tested for impact on clinical outcomes
- To define the highest quality of care within cost constraints of the current healthcare environment.

## Target Population

Adult (19 to 44 years), Middle Age (45 to 64 years), Aged (65 to 79 years), Advanced Aged (80 years and over), Male, Female

## Target Population Description

Adults with COPD.

## Interventions and Practices Considered

The COPD Evidence-Based Nutrition Practice Guideline is based on the Academy of Nutrition and Dietetics' Nutrition Care Process and Model, which involves the following steps. Terms relevant to the treatment of adults with COPD come from the Nutrition Terminology Reference Manual (eNCPT, 2018).

- Nutrition Assessment
- Nutrition Diagnosis
- Nutrition Intervention
- Nutrition Monitoring and Evaluation.

This guideline addresses topics that correspond to the following areas of the Nutrition Care Process.

- I. Referral to a Registered Dietitian Nutritionist
- II. Medical Nutrition Therapy.

Reference:

Academy of Nutrition and Dietetics. Nutrition Terminology Reference Manual (eNCPT): Dietetics Language for Nutrition Care. 2018 edition. Accessed June 2, 2019: <http://www.ncpro.org>.

## Future Research Needs

The COPD Expert Work Group identified several areas for future research based on their review of the literature and subsequent evidence analysis. Suggestions regarding research methodology were also made.

Based on this systematic review, additional research is needed for adults with COPD in the following areas:

- MNT intervention alone (not as part of a multidisciplinary program), including the frequency and duration of visits provided by an RDN (or international equivalent)
- Define optimal nutrition interventions to maintain lung function, decrease exacerbations and mortality, and improve QOL.
- Further investigation into Vitamin D supplementation, including dosing, timing, delivery routes, and length of intervention. Optimal serum 25(OH)D concentrations in COPD also remain undefined.
- The optimal macronutrient distribution in COPD remains undefined.
- Determine of most accurate methods to calculate resting metabolic rate (RMR) and total energy expenditures (TEE)
- The effect of body composition, and changes in body composition over time, needs further research.

Research methodology:

- Additional trials addressing the systemic and heterogeneous nature of COPD are needed.
- Few longitudinal studies have been conducted with regard to nutrition and COPD.

The Academy of Nutrition and Dietetics supports and encourages member participation in nutrition research. Contribution to nutrition research is essential to improve the effectiveness of nutrition interventions and thus, patient care.

The Academy has [two main resources](#) for data collection, which is free to Academy members:

**Dietetics Practice Based Research Network (DPBRN)** is a network of RDNs who are members of the Academy and are interested in research. DPBRN provides education resources and opportunities for members to participate in research.

**Academy of Nutrition and Dietetics Health Informatics Infrastructure (ANDHII)** provides tools for RDNs to collect outcomes. Dietitians can collect outcomes for their own research project and add anonymous data to the national Dietetics Outcomes Registry, contributing to the evidence supporting nutrition practice and helping ensure high-quality patient care.

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## Chronic Obstructive Pulmonary Disease

### COPD: Statement of Intent (2019)

#### Statement of Intent

Evidence-based nutrition practice guidelines are developed to help dietetic practitioners, patients and consumers make shared decisions about health care choices in specific clinical circumstances. If properly developed, communicated and implemented, guidelines can improve care.

While they represent a statement of best practice based on the latest available evidence at the time of publishing, they are not intended to overrule professional judgment. Rather, they may be viewed as a relative constraint on individual clinician discretion in a particular clinical circumstance. The independent skill and judgment of the health care provider must always dictate treatment decisions. These nutrition practice guidelines are provided with the express understanding that they do not establish or specify particular standards of care, whether legal, medical or other.

#### The Role of Patient Preference

This guideline recognizes the role of patient preferences for possible outcomes of care, when the appropriateness of a clinical intervention involves a substantial element of personal choice or values. With regard to types of evidence that are associated with particular outcomes, Shaughnessy and Slawson (1-3) describe two major classes. Patient-oriented evidence that matters (POEM) deals with outcomes of importance to patients, such as changes in morbidity, mortality or quality of life. Disease-oriented evidence (DOE) deals with surrogate end-points, such as changes in laboratory values or other measures of response. Although the results of DOE sometimes parallel the results of POEM, they do not always correspond.

When possible, the Academy of Nutrition and Dietetics recommends using POEM-type evidence rather than DOE. When DOE is the only guidance available, the guideline indicates that key clinical recommendations lack the support of outcomes evidence.

#### References

1. Slawson DC, Shaughnessy AF. Becoming an information master: using POEMs to change practice with confidence. Patient-Oriented Evidence that Matters. *J Fam Pract.* 2000 Jan;49(1):63-7. Erratum in: *J Fam Pract* 2000 Mar;49(3): 276.
2. Slawson DC, Shaughnessy AF, Ebell MH, Barry HC. Mastering medical information and the role of POEMs--Patient-Oriented Evidence that Matters. *J Fam Pract.* 1997 Sep;45(3): 195-196.
3. Shaughnessy AF, Slawson DC. POEMs: patient-oriented evidence that matters. *Ann Intern Med.* 1997 Apr 15;126(8): 667.

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## Chronic Obstructive Pulmonary Disease

### COPD: Guideline Methods and Stakeholders (2019)

#### Evidence-based Nutrition Practice Guideline Methods and Stakeholder Involvement

Evidence-based Nutrition Practice Guidelines (EBNPGs) and their supporting systematic reviews (SR) are developed by a multidisciplinary team, with oversight by the Academy of Nutrition and Dietetics' Council on Research. The multidisciplinary team includes a volunteer expert workgroup, a project manager, lead analyst, and medical librarian, several analysts, and Academy staff experts in systematic review methodology. The expert workgroup is composed of health practitioners and researchers with extensive experience working with the population of interest. The expert workgroup represents the views and concerns of the target population throughout the development of the SR and EBNPG.

After conducting a needs assessment and evaluation of existing guidelines on the topic under investigation, the expert workgroup develops the scope of the guideline. The rationale, background, and objectives of the topic and the outcomes of interest to both the practitioners and the targeted population, form the framework for conducting the SR. The team implements the steps in the SR process as follows:

- 1) Formulate Question
- 2) Gather and Classify Research
- 3) Critically Appraise each Article (Risk of Bias)
- 4) Summarize the Evidence
- 5) Develop Conclusion Statement and Grade Strength of the Evidence.

The team develops the EBNPG recommendations based on support of the EAL conclusion statements and strength of the evidence. An EBNPG may also be supplemented with recommendations based on either EBPC-approved external guidelines or on expert opinion (consensus). References, including those used in the SR, external guidelines, and other credible sources are included at the bottom of each recommendation. See the **Recommendations and Supporting Evidence** tab for links to each full recommendation.

The completed EBNPG draft undergoes appraisal by an interdisciplinary group of external reviewers. The external reviewers are solicited through Academy communications, via email and social media. Those reviewers with experience in guideline methodology and/or experience with the target population complete the comprehensive AGREE II survey. Survey results are then considered by the expert workgroup and incorporated into revisions of the EBNPG, before submission for final approval and publication by the EBPC.

Development of an Academy EBNPG is a rigorous and transparent process, critically evaluating the latest scientific evidence and consensus to inform RDN practice. Stakeholder input and involvement is integral to the development of EBNPGs. The Academy continues to make strides in ensuring that the target population's views and concerns are taken into consideration during the development of EAL guidelines and supporting SRs. The patient/consumer and public involvement is now considered a key component in the development of a clinical practice guidelines by

organizations who develop clinical guidelines. The patient advocate's role in the workgroup is to express the viewpoint of the patient group he or she represents, including the value of the benefits and risks of various treatments. This COPD EBNPG was the Academy's pilot for the inclusion of a patient advocate as a workgroup member.

#### More Information

For a full description of the EAL systematic review and guideline development process, see the **Policy and Process tab** in the main navigation bar (green) at the top of the page.

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## Chronic Obstructive Pulmonary Disease

### COPD: Specific Methods (2019)

Chronic Obstructive Pulmonary Disease (2019) Evidence-Based Nutrition Practice Guideline

Search Criteria and Results for Specific Topics

Each evidence analysis topic has a link to supporting evidence, where the Search Plan and Results can be found. Here, you can view when the search plan was performed, inclusion and exclusion criteria, search terms, databases that were searched and the excluded articles.

Below are a list of the recommendations and the related evidence analysis questions, with the link to each search plan. Some recommendations are supported by multiple conclusion statements and therefore have multiple search plans listed.

#### Screening and Referral

None.

#### Nutrition Assessment

COPD: Assessment of Energy Intake

[COPD: Energy and Macronutrient Intake and Composition Search Plan and Results](#)

COPD: Assessment of Body Weight

[COPD: Body Weight and Composition Search Plan and Results](#)

COPD: Assessment of Energy Needs

[COPD: Methods to Estimate Energy and Protein Requirements Search Plan and Results](#)

COPD: Assessment of Serum 25(OH)D Status

[COPD: Vitamin D Search Plan and Results](#)

#### Nutrition Diagnosis

None.

#### Nutrition Intervention

COPD: Medical Nutrition Therapy

[COPD: Medical Nutrition Therapy Search Plan and Results](#)

COPD: Energy Prescription

[COPD: Energy and Macronutrient Intake and Composition Search Plan and Results](#)

[COPD: Body Weight and Composition Search Plan and Results](#)

[COPD: Methods to Estimate Energy and Protein Requirements Search Plan and Results](#)

COPD: Macronutrient Composition (Percent Distribution)

[COPD: Energy and Macronutrient Intake and Composition Search Plan and Results](#)

COPD: Vitamin D Supplementation

[COPD: Vitamin D Search Plan and Results](#)

#### Nutrition Monitoring and Evaluation

COPD: Monitor and Evaluate Energy Intake and Body Weight for Energy Needs

[COPD: Body Weight and Composition Search Plan and Results](#)

[COPD: Energy and Macronutrient Intake and Composition Search Plan and Results](#)

[COPD: Methods to Estimate Energy and Protein Requirements Search Plan and Results](#)

COPD: Monitor and Evaluate Serum 25(OH)D Status

[COPD: Vitamin D Search Plan and Results](#)

COPD: Monitor and Evaluate Effect of Vitamin D Supplementation

[COPD: Vitamin D Search Plan and Results](#)

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# Chronic Obstructive Pulmonary Disease

## COPD: Implementation of the Guideline (2019)

### Implementation of the Guideline

The publication of this guideline is an integral part of the plans for disseminating the Academy of Nutrition and Dietetics evidence-based recommendations on chronic obstructive pulmonary disease (COPD) to all dietetics practitioners engaged in, teaching about or researching GDM, as quickly as possible. National implementation workshops at various sites around the country and during the Academy Food Nutrition Conference Expo (FNCE) are planned. Additionally, there are recommended dissemination and adoption strategies for local use of the Academy COPD Evidence-Based Nutrition Practice Guideline.

The guideline development team recommended multi-faceted strategies to disseminate the guideline and encourage its implementation. Management support and learning through social influence are likely to be effective in implementing guidelines in dietetic practice. However, additional interventions may be needed to achieve real change in practice routines.

Implementation of the COPD Guideline will be achieved by announcement at professional events, presentations and training. Some strategies include:

- *National and local events:* State dietetic association meetings and media coverage will help launch the guideline
- *Local feedback adaptation:* Presentation by members of the work group at peer review meetings and opportunities for CEUs for courses will be provided
- *Education initiatives:* The guideline and supplementary resources will be freely available for use in the education and training of dietetic interns and students in approved Accreditation Council for Education in Nutrition and Dietetics (ACEND) programs
- *Champions:* Local champions will be identified and expert members of the guideline team will prepare articles for publications. Resources will be provided that include PowerPoint presentations, full guidelines and pre-prepared case studies

Specific distribution strategies include:

- *Publication in full:* The guideline will be available electronically at the Academy Evidence Analysis Library website ([www.andeal.org](http://www.andeal.org)) and will be announced to all the dietetic practice groups. The Academy Evidence Analysis Library will also provide downloadable supporting information.

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# Chronic Obstructive Pulmonary Disease

## COPD: Benefits and Risks/Harms of Implementation (2019)

### Benefits and Risks/Harms of Implementing the Recommendations

Factors to consider when exploring treatment options include:

- Patient's socioeconomic status, cultural issues, psychosocial and mental health status, and other health history, and individual and health conditions
- Referral to a behavioral specialist, if psychosocial issues are a concern
- Referral to social services to assist individuals with financial arrangements, if economic issues are a concern
- Use clinical judgement when evaluating patients with co-morbid conditions, such as hypertension, diabetes, obesity, osteoporosis and dialysis.
- Costs may include expenses related to MNT visits from an RDN.
- For group counseling, such as pulmonary rehabilitation, adequate staffing with expertise in the major component areas of COPD management and adequate space for counseling are required.
- Cognitive ability and healthy literacy may impact the learning process (Blackstock et al, 2018). Therefore, an understanding of patient needs should be incorporated into the intervention format (Blackstock et al, 2018). Training and educational materials should be appropriate, and culturally relevant for each participant.
- Absenteeism and attrition may impact the success of counseling. Participation may be limited by the location of counseling (distance from home or workplace), the duration length and frequency of sessions.
- To optimize outcomes, identification of factors that may hinder learning (e.g., conditions such as anxiety or depression) should be identified and addressed (Blackstock et al, 2018).
- Costs may be incurred due to lab testing to evaluate serum 25(OH)D levels.
- Achievement of normal serum 25(OH)D levels may not be possible in all instances. Therefore, optimizing serum 25(OH)D levels is the goal (Rusinska et al, 2018).
- Frequency of monitoring serum 25(OH)D levels post supplementation should be at 3-month intervals (Rusinska et al, 2018).
- Coordination with the prescribing provider may be required for vitamin D supplement orders or changes in orders.
- Costs may be incurred related to the purchase of over-the-counter vitamin D supplements or co-pays.
- Lifestyle, financial barriers, personal preferences should be considered when individualizing the macronutrient distribution.
- If necessary data are not available, the RDN should use professional judgment to request or obtain additional data.
- An optimal body weight goal should be individualized for each patient.
- The Westterp equation requires body composition measurements (fat-free mass and body fat) for calculation of RMR. Thus, its utility in clinical care may be limited.
- Clinical judgement should be used in applying predictive equations for total energy expenditure (TEE) to individuals  $\geq 30\text{kg/m}^2$ .
- The RDN should use clinical judgement in determining the body weight value used in calculations. Use of adjustments to body weight for obesity or volume status were not mentioned anywhere in the available studies.

For more information on benefits, risks/harms, conditions and costs of applying the recommendations, see full recommendations in the **Recommendations and Supporting Evidence tab**.

### References:

Blackstock FC, Lareau SC, Nici L, ZuWallack R, Bourbeau J, Buckley M, Durning SJ, Effing TW, Egbert E, Goldstein RS, Kelly W, Lee A, Meek PM, and Singh S; on behalf of the American Thoracic Society, Thoracic Society of Australia and New Zealand, Canadian Thoracic Society, and British Thoracic Society. Chronic Obstructive Pulmonary Disease Education in Pulmonary Rehabilitation. An Official American Thoracic Society/Thoracic Society of Australia and New Zealand/Canadian Thoracic Society/British Thoracic Society Workshop Report. 2018. *Ann Am Thorac Soc* Vol 15, No 7, 769–784, Jul 2018.

Rusinska A, Pludowski P, Walczak M, Borszewska-Kornacka MK, Bossowski A, Chlebna-Sokol D, Czech-Kowalska J, Dobrzanska A, Franek E, Helwich E, Jackowska T, Kalina MA, Konstantynowicz J, Ksiazek J, Lewinski A, Lukaszkiwicz J, Marcinowska-Suchowierska E, Mazur A, Michalus I, Peregud-Pogorzelski J, Romanowska H, Ruchala M, Socha P, Szalecki M, Wielgos M, Zwolinska D, Zygmont A. Vitamin D Supplementation Guidelines for General Population and Groups at Risk of Vitamin D Deficiency in Poland-Recommendations of the Polish Society of Pediatric Endocrinology and Diabetes and the Expert Panel With Participation of National Specialist Consultants and Representatives of Scientific Societies-2018 Update. *Front Endocrinol (Lausanne)*. 2018 May 31;9:246. doi: 10.3389/fendo.2018.00246. eCollection 2018. Review. PMID: 2990437.

### Potential Benefits

When implementing these recommendations, consider the following general benefits:

- Improve the patient's ability to achieve optimal nutrition through healthful food choices and physically active lifestyle.
- Achieve and maintain body weight goals
- Achieve better QOL through decreased exacerbations and dyspnea.

### Risk/Harm Considerations

Potential risks/harms to consider, when exploring treatment options include:

- Predictive equations may under- or over-estimate energy needs in adults with COPD. Therefore, if adverse changes in body weight or composition are occurring, equal attention should be paid to the possibility that the patient is not consuming up to the target intake, or that the target intake is not correct.

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## Chronic Obstructive Pulmonary Disease

### COPD: Background Information (2019)

#### Bibliographic Source

Academy of Nutrition and Dietetics. Academy of Nutrition and Dietetics Chronic Obstructive Pulmonary Disease Evidence-Based Nutrition Practice Guideline, Chicago (IL): Academy of Nutrition and Dietetics, 2019.

#### Adaptation

This guideline was not adapted from another source. Development of the guideline was conducted in accordance with the Appraisal of Guidelines Research and Evaluation critical appraisal instrument.

#### Date Released

2019

#### Guideline Developer

Professional Association

#### Guideline Status

#### Guideline Availability

#### Copyright Statement

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When modifying the guidelines for local circumstances, significant departures from these comprehensive guidelines should be fully documented and the reasons for the differences explicitly detailed.

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