



Topic Brief: Dietary Risk Factors for Parkinson's Disease

Date: 12/06/2019

Nomination Number: 0842

Purpose: This document summarizes the information addressing a nomination submitted on 2/1/2019 through the Effective Health Care Website. This information was used to inform the Evidence-based Practice Center (EPC) Program decisions about whether to produce an evidence report on the topic, and if so, what type of evidence report would be most suitable.

Issue: The nominator wanted to find out whether dietary factors influence the risk for incidence and/or progression of Parkinson's disease. In addition, he also wanted to know whether medical nutrition therapy decreases the risk for disease progression and whether such therapy should be administered by registered dietician nutritionists.

Program Decision: The EPC Program will not develop a new systematic review because we did not find enough primary studies addressing the concerns of this nomination.

Key findings

- We did not find any duplicative systematic reviews which addresses the topic nomination.
- We found only one pertinent study in a random sample of abstracts from a targeted literature search suggesting not enough new primary studies exist for a systematic review on the topic.

Background

- Parkinson's disease (PD) is a brain disorder that leads to tremors, stiffness and problems with walking and balance. It is caused by degeneration of neurons that produce dopamine in the brain. It is not known what causes this degeneration. Most people develop this disease at about 60 years old.¹
- There were 680,000 individuals in the United States aged ≥ 45 years with PD in 2010 and that that number will rise to approximately 930,000 in 2020 and 1,238,000 in 2030 based on the US Census Bureau population projections.² The combined direct and indirect cost PD, including treatment, social security payments and lost income, is estimated to be nearly \$52 billion per year in the USA.³
- Whether specific dietary characteristics influence PD progression is unclear. Apart from cautioning patient about potential decreased absorption and efficacy of levodopa preparations when taken close to a protein-rich meal, there is no specific diet prescribed to PD patients to prevent disease progression.⁴
- Several studies published prior to 2014 report associations between high dairy product consumption and increased risk for PD⁵⁻⁷ as well as high coffee consumption and decreased risk for PD;^{8, 9} however, not all findings have been consistent.¹⁰

- If diet does indeed contribute to PD incidence and progression, it presents an opportunity for prevention since it could be a potentially modifiable risk factor.

Nomination Summary

- This topic was nominated by the Senior Director for Government and Regulatory Affairs of the Academy of Nutrition and Dietetics on behalf of his organization, which represents more than 100,000 credentialed practitioners including registered dietitian nutritionists, dietetic technicians, and other dietetics and nutrition professionals and students.
- The nominating organization plans to use the resulting systematic review to develop a practice guideline.

Scope

1. What is the effect of diet on incidence and progression of Parkinson’s Disease?
 - a. Does the effect vary by race/ethnicity?
 - b. Does the effect vary by gender?
2. What are the benefits and harms of medical nutrition therapy provided by registered dietitian nutritionists on patients with Parkinson’s Disease?
 - a. Are the benefits and harms influenced by the manner of medical nutrition therapy delivery and/or setting (i.e. best practices research)?

Table 1. Questions and PICOTS (population, intervention, comparator, outcome, timing and setting)

Questions	1. Diet and Incidence/Progression of PD	2. Benefits/harms of nutrition therapy
Population	Adolescents and adults	Adolescents and adults with PD
Interventions	All diet types (with interest in elderly malnutrition)	Medical nutrition therapy provided by registered dietitian nutritionists
Comparators	<ul style="list-style-type: none"> • Standard diet • Different diets compared to each other 	Standard of care
Outcomes	<ul style="list-style-type: none"> • Risk for incident PD (includes early onset and late onset disease) • Progression of PD (includes early onset and late onset disease) 	<ul style="list-style-type: none"> • Progression of PD (includes early onset and late onset disease) • Quality-of-life
Timing	All timing	All timing
Setting	All settings	Physician’s office/care centers vs. other settings such as home care, etc.

Abbreviations: PD=Parkinson’s Disease

Assessment Methods

See Appendix A.

Summary of Literature Findings

We did not find any systematic review in the last three years that addresses any of the key questions. We found one article that analyzed data from two large prospective cohort studies, which reported that frequent consumption of dairy products appeared to be associated with a modest increased risk of PD in both men and women.¹¹ We found no relevant trials on ClinicalTrials.gov.

Table 2. Literature identified for each Question

Question	Systematic reviews (3/2016-3/2019)	Primary studies (1/2014-3/2019)
Question 1: Diet and Incidence/Progression of PD	Total: 0	Total: 1 <ul style="list-style-type: none"> • Prospective cohort – 1¹¹ Clinicaltrials.gov: 0
Question 2: Benefits/harms of nutrition therapy	Total: 0	Total: 0 Clinicaltrials.gov: 0

See Appendix B for detailed assessments of all EPC selection criteria.

Summary of Selection Criteria Assessment

While clarifying the contribution of dietary factors to the incidence and progression of PD and determining the role of medical nutrition therapy to reduce PD progression risk are worthwhile objectives, the research literature is too scant to properly inform a systematic review at this time.

Please see Appendix B for detailed assessments of individual EPC Program selection criteria.

References

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Conflict of Interest: None of the investigators have any affiliations or financial involvement that conflicts with the material presented in this report.

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Appendix A: Methods

We assessed nomination for priority for a systematic review or other AHRQ Effective Health Care report with a hierarchical process using established selection criteria. Assessment of each criteria determined the need to evaluate the next one. See Appendix B for detailed description of the criteria.

Appropriateness and Importance

We assessed the nomination for appropriateness and importance.

Desirability of New Review/Absence of Duplication

We searched for high-quality, completed or in-process evidence reviews published in the last three years from March 14, 2019 on the questions of the nomination from these sources:

- AHRQ: Evidence reports and technology assessments
 - AHRQ Evidence Reports <https://www.ahrq.gov/research/findings/evidence-based-reports/index.html>
 - EHC Program <https://effectivehealthcare.ahrq.gov/>
 - US Preventive Services Task Force <https://www.uspreventiveservicestaskforce.org/>
 - AHRQ Technology Assessment Program <https://www.ahrq.gov/research/findings/ta/index.html>
- US Department of Veterans Affairs Products publications
 - Evidence Synthesis Program <https://www.hsrd.research.va.gov/publications/esp/>
 - VA/Department of Defense Evidence-Based Clinical Practice Guideline Program <https://www.healthquality.va.gov/>
- Cochrane Systematic Reviews <https://www.cochranelibrary.com/>
- PROSPERO Database (international prospective register of systematic reviews and protocols) <http://www.crd.york.ac.uk/prospéro/>
- PubMed <https://www.ncbi.nlm.nih.gov/pubmed/>

Impact of a New Evidence Review

The impact of a new evidence review was qualitatively assessed by analyzing the current standard of care, the existence of potential knowledge gaps, and practice variation. We considered whether it was possible for this review to influence the current state of practice through various dissemination pathways (practice recommendation, clinical guidelines, etc.).

Feasibility of New Evidence Review

We conducted a limited literature search in PubMed from the last five years from January 2014 to March 13, 2019. Because a large number of articles were identified, we reviewed a random sample of 200 titles and abstracts for each question for inclusion. We classified identified studies by question and study design, to assess the size and scope of a potential evidence review. We then calculated the projected total number of included studies based on the proportion of studies included from the random sample. We reviewed all identified titles and abstracts for inclusion and classified identified studies by question and study design to estimate the size and scope of a potential evidence review.

Search strategy

Ovid MEDLINE(R) and Epub Ahead of Print, In-Process & Other Non-Indexed Citations and Daily 1946 to March 13, 2019

Date Searched: March 14, 2019

	Searches	Results
1	parkinson disease/	61008
2	"parkinson* disease".ti,ab,kf.	83870
3	or/1-2	96785
4	exp diet/ or exp diet therapy/ or enteral nutrition/ or malnutrition/ or nutrition assessment/ or exp nutrition therapy/ or nutritional support/ or nutritionists/ or parenteral nutrition/ or dh.fs.	350506
5	((((calorie or caloric) adj2 restrict*) or diet or diets or dietary or dietitian* or enteral or gluten or ketogenic or ketonic or macronutri* or micronutri* or malnutrition or nutrient* or nutrition* or parenteral).ti,ab,kf.	809748
6	or/4-5	924472
7	and/3,6	1727
8	limit 7 to english language	1621
9	limit 8 to yr="2014-Current"	674

ClinicalTrials.gov

Date Searched: March 14, 2019

Parkinson Disease [DISEASE] AND (calorie restriction OR caloric restriction OR diet OR dietary OR dietitian OR enteral OR gluten OR ketogenic OR ketonic OR macronutrient OR micronutrient OR malnutrition OR nutrient OR nutrition OR nutritional OR nutritionist OR parenteral) [TREATMENT] AND INFLECT ("01/01/2009" : "03/14/2019") [START-DATE]

Appendix B. Selection Criteria Assessment

Selection Criteria	Assessment
1. Appropriateness	
1a. Does the nomination represent a health care drug, intervention, device, technology, or health care system/setting available (or soon to be available) in the U.S.?	Yes, this topic represents interventions available in the United States.
1b. Is the nomination a request for an evidence report?	Yes, this topic is a request for a systematic review.
1c. Is the focus on effectiveness or comparative effectiveness?	The focus of this review is on effectiveness.
1d. Is the nomination focus supported by a logic model or biologic plausibility? Is it consistent or coherent with what is known about the topic?	Yes, it is biologically plausible and is consistent with what is known about the topic.
2. Importance	
2a. Represents a significant disease burden; large proportion of the population	Yes. 680,000 individuals in the United States aged ≥ 45 years with PD in 2010. That number will rise to approximately 930,000 in 2020 and 1,238,000 in 2030 based on the US Census Bureau population projections.
2b. Is of high public interest; affects health care decision making, outcomes, or costs for a large proportion of the US population or for a vulnerable population	Yes. The risk for PD increases with age when individuals are expected to suffer other age-related, and usually chronic, medical conditions and comorbidities.
2c. Incorporates issues around both clinical benefits and potential clinical harms	Yes, this nomination addresses both benefits and potential harms of nutritional therapy for reduction of risk of PD progression.
2d. Represents high costs due to common use, high unit costs, or high associated costs to consumers, to patients, to health care systems, or to payers	Yes. The combined direct and indirect cost PD, including treatment, social security payments and lost income, is estimated to be nearly \$52 billion per year in the USA.
3. Desirability of a New Evidence Review/Absence of Duplication	
3. A recent high-quality systematic review or other evidence review is not available on this topic	An existing review is currently not available for this topic
4. Impact of a New Evidence Review	
4a. Is the standard of care unclear (guidelines not available or guidelines inconsistent, indicating an information gap that may be addressed by a new evidence review)?	There is no prescribed diet for patients with PD though dietary precautions, which warns against taking levodopa close to a protein-rich meal as it may interfere with drug absorption, exist.
4b. Is there practice variation (guideline inconsistent with current practice, indicating a potential implementation gap and not best addressed by a new evidence review)?	There is no practice variation.
5. Primary Research	

Selection Criteria	Assessment
<p>5. Effectively utilizes existing research and knowledge by considering:</p> <ul style="list-style-type: none"> - Adequacy (type and volume) of research for conducting a systematic review - Newly available evidence (particularly for updates or new technologies) 	<p>A review is not feasible due to an estimated very small number of studies in the past five years.</p> <p>We found one article that analyzed data from two large prospective cohort studies, which reported that frequent consumption of dairy products appeared to be associated with a modest increased risk of PD in both men and women.</p> <p>We found no relevant trials on ClinicalTrials.gov.</p>

Abbreviations: AHRQ=Agency for Healthcare Research and Quality; PD=Parkinson’s Disease