

Let them eat nuts—this snack is safe for diverticulosis patients

***J Fam Pract.* 2009;58:82-84.**

Potential PURL Review Form: Cohort study

SECTION 1: IDENTIFYING INFORMATION

1. Citation Strate LL, Liu YL, Syngal S, Aldoori WH, Giovannucci EL. Nut, corn, and popcorn consumption and incidence of diverticular disease. *JAMA*. 2008;300:907-914.
2. Hypertext link to PDF of full article <http://www.ncbi.nlm.nih.gov/entrez/utils/fref.fcgi?PrId=3051&itool=AbstractPlus-def&uid=18728264&db=pubmed&url=http://jama.ama-assn.org/cgi/pmidlookup?view=long&pmid=18728264>
3. First date published study available to readers August 27, 2008
4. PubMed ID 18728264
5. Nominated By Sarah-Anne Schumann
6. Institutional Affiliation of Nominator University of Chicago
7. Date Nominated August 27, 2008
8. Identified Through *JAMA*
9. PURLS Editor Reviewing Nominated Bernard Ewigman
10. Nomination Potential PURL Decision Date September 2, 2008
11. Potential PURL Review Form (PPRF) Type Cohort Study
12. Other comments, materials or discussion
13. Assigned Potential PURL Reviewer Mike Mendoza
14. Reviewer Affiliation University of Chicago
15. Date Review Due August 18, 2008
16. Abstract
CONTEXT: Patients with diverticular disease are frequently advised to avoid eating nuts, corn, popcorn and seeds to reduce the risk of complications. However, there is little evidence to support this recommendation.
OBJECTIVE: To determine whether nut, corn, or popcorn consumption is associated with diverticular disease and diverticular bleeding.
DESIGN AND SETTING: The Health Professionals Follow-up Study is a cohort of US men followed prospectively from 1986 to 2004 via self-administered questionnaires about medical (biennial) and dietary (every 4 years) information. Men reporting newly diagnosed diverticulosis or diverticulitis were mailed supplemental questionnaires.
PARTICIPANTS: The study included 47,228 men aged 40 to 75 years who at baseline were free of diverticulosis or its complications, cancer, and inflammatory bowel disease, and returned a food-frequency questionnaire.
MAIN OUTCOME MEASURES: Incident diverticulitis and diverticular bleeding.
RESULTS: During 18 years of follow-up, there were 801 incident cases of diverticulitis and 383 incident cases of diverticular bleeding. We found inverse associations between nut and popcorn consumption and the risk of diverticulitis. The multivariate hazard ratios for men with the highest intake of each food

(at least twice per week) compared with men with the lowest intake (less than once per month) were 0.80 (95% confidence interval [CI], 0.63-1.01; *P* for trend=.04) for nuts and 0.72 (95% CI, 0.56-0.92; for trend=.007) for popcorn. No associations were seen between corn consumption and diverticulitis between nut, corn, or popcorn consumption and diverticular bleeding or uncomplicated diverticulosis. CONCLUSIONS: In this large, prospective study of men without known diverticular disease, nut, corn, and popcorn consumption did not increase the risk of diverticulosis or diverticular complications. The recommendation to avoid these foods to prevent diverticular complications should be reconsidered.

SECTION 2: CRITICAL APPRAISAL OF VALIDITY

1. The study addresses an appropriate and clearly focused question. - **select one**

- | | |
|--|---|
| <input type="checkbox"/> Well covered | <input type="checkbox"/> Not addressed |
| <input type="checkbox"/> Adequately addressed | <input type="checkbox"/> Not reported |
| <input checked="" type="checkbox"/> Poorly addressed | <input type="checkbox"/> Not applicable |

Comments: The study excluded patients with, among other things, known diverticular disease. Then the investigators looked prospectively comparing the development of diverticulitis and diverticular bleeding between infrequent and very frequent consumers of nuts, corn, and popcorn.

The real world clinical scenario, however, is not whether to recommend seeds or not to otherwise healthy men. The clinical conundrum is whether or not to recommend a no-seed diet to someone with known diverticular disease. An experimental design in which the rate of diverticular complications was compared between patients with known diverticulosis and a demographically matched control group would seem to be the better design for answering the question "Do seeds lead to more diverticular complications than not among patients with known diverticulosis?"

2. The 2 groups being studied are selected from source populations that are comparable in all respects other than the factor under investigation.

Well covered
Adequately addressed

Comments: The study compared extremely infrequent (<1 times/month) and extremely frequent (2 or more times/wk) consumers of nuts. The standard unit of comparison was equivalent to cups of nuts. The authors went to great lengths to identify and control for other confounders (red meat, total fiber, fat, physical activity, use of NSAIDs, smoking), whether symptoms of undiagnosed diverticular disease lead to reduced nut consumption, and whether nut consumption influences the development of diverticulosis. In all instances, the authors reported no effect.

3. The study indicates how many of the people asked to take part did so, in each of the groups being studied

Well covered

4. The likelihood that some eligible subjects might have the outcome at the time of enrollment is assessed and taken into account in the analysis.

Well covered

5. What percentage of individuals or clusters recruited into each arm of the study dropped out before the study was completed?

Not reported.

6. Comparison is made between full participants and those lost to follow up, by exposure status.	Adequately addressed
7. The outcomes are clearly defined.	Well covered
8. The assessment of outcome is made blind to exposure status.	Well covered
9. Where blinding was not possible, there is some recognition that knowledge of exposure status could have influenced the assessment of outcome.	Not applicable
10. What are the key findings of the study?	<p>There was a protective effect from eating nuts and popcorn on the risk of developing diverticulitis. When comparing the highest intake group with the lowest intake group, the hazard ratio was 0.80 (0.63-1.01, <i>P</i> for trend=.04) for nuts, and 0.72 (0.56-0.92, <i>P</i> for trend=.007) for popcorn.</p> <p>No associations seen between corn and diverticulitis.</p> <p>No associations seen between nut, corn, or popcorn consumption and diverticular bleeding or uncomplicated diverticulosis.</p> <p>No potential conflicts of interest reported.</p>
11. How was the study funded? Any conflicts of interest? Any reason to believe that the results may be influenced by other interests?	No potential conflicts of interest reported.

SECTION 3: REVIEW OF SECONDARY LITERATURE

1. DynaMed excerpts

2. DynaMed citation/access date
 Diverticular bleeding. In: Dynamed [database online]. Available at: <http://www.DynamicMedical.com/exchweb/bin/redirect.asp?URL=http://www.dynamicmedical.com/> . Last updated Sept 25 2008. Accessed January 27, 2009.

3. Bottom line recommendation or summary of evidence from DynaMed (1-2 sentences)
 Avoidance of nuts and seeds prevents neither diverticulitis nor complications. However, this was based on Level 3 (lacking direct) evidence.

4. UpToDate excerpts

5. UpToDate citation/access date

Young-Fadok, T. Patient information: diverticular disease. In: Rose BD, ed. UpToDate [database online]. Waltham, MA; 2007. Available at: <http://www.uptodate.com/exchweb/bin/redirect.asp?URL=http://www.uptodate.com/>. Last updated September 8, 2008. Accessed January 27, 2009.

6. Bottom line recommendation or summary of evidence from UpToDate (1-2 sentences)

Describes the traditional recommendation of avoiding seeds and nuts as a completely unproven belief.

7. PEPID PCP excerpts

CI: What is the most beneficial diet for patients with diverticulosis?

Evidence-Based Answer (Pub September 2006)

A diet high in fiber (particularly fruit and vegetable fiber) and low in fat and red meat may help to decrease the risk of symptomatic diverticular disease (strength of recommendation [SOR]: C, case-control studies and a large prospective cohort study)

- For people with diverticular disease, a diet high in fiber might decrease the risk of complications (SOR: C, case series)
- No studies have evaluated the effect of nut and seed avoidance

Evidence Summary

1. Approximately 60% of people living in Westernized countries who are older than 60 years will develop diverticulosis of the colon

- Colonic diverticula are thought to develop from an increase in intraluminal pressure
- This pressure can be caused by colonic motility abnormalities, but a low-fiber diet can also result in a smaller stool mass and a less distended colon, thereby increasing intraluminal pressure

2. Because of strong epidemiological evidence that people from cultures with high-fiber diets are far less likely to develop diverticulosis than people from cultures with low-fiber diets, it has been assumed that a high in fiber can prevent diverticulosis

- Many small, uncontrolled studies have also investigated the effect of high-fiber diets and supplements on symptoms of diverticulosis and prevention of diverticulitis episodes

3. One large, prospective study of 47,888 male health professionals gathered baseline dietary information in 1986

- In 1990 and 1992, follow-up questionnaires asked the subjects if they had been diagnosed with diverticular disease in the interim, and whether they had symptoms of diverticulitis
- The study showed a strong inverse relationship between fruit and vegetable fiber intake and risk of symptomatic diverticular disease
- It also demonstrated a direct relationship between fat intake, particularly red meat, and symptomatic diverticular disease
- For men in the highest quintile of total fat intake and lowest quintile of total fiber intake, the relative risk (RR) of diverticular disease was 2.35 (95% CI, 1.38–3.98) compared with men in the highest quintile of total fiber intake and lowest quintile of total fat intake
- Men in the highest group of red meat intake and lowest quintile of fiber intake had an RR of 3.22 (95% CI, 1.46–7.54) compared with men with the lowest red meat intake and highest dietary fiber intake
- In this study, cereal fiber did not reduce the risk of symptomatic diverticular disease

4. Two small, randomized crossover studies evaluated the benefit of dietary fiber supplementation on symptomatic diverticular disease, with conflicting results

- One study found that sterculia gum with an antispasmodic, a high roughage diet, and bran tablets all improved symptomatic diverticular disease, with bran tablets associated with the greatest improvement
- Another study found no significant differences between psyllium, bran, and placebo in reducing symptomatic diverticular disease
- However, the amount of total fiber supplementation for each treatment regimen was less than in other studies

5. A small randomized trial of lactulose vs dietary fiber showed both treatments to be effective in alleviating symptoms of diverticular disease

- Two small case series of adults treated with dietary fiber found that fiber alleviated symptoms of diverticular disease and possibly reduced complications of diverticulosis
6. We found no studies that investigated the common medical advice to avoid small nuts and seeds, which are thought to cause obstruction of the diverticula and lead to diverticulitis

Recommendations from Others

The American College of Gastroenterology states that it is reasonable to recommend a diet high in fruit and vegetable fiber to patients with uncomplicated diverticulosis

Clinical Commentary

Recommend natural sources of fiber for diverticulosis

"Conventional wisdom" dictates that physicians recommend a high-fiber diet to prevent symptoms in patients who are found to have diverticula on endoscopic or radiographic studies, or who are diagnosed clinically with diverticulosis. Although there is a relative paucity of data, the clinical evidence, as set forth in this review, supports this practice. Insoluble fiber, and cellulose in particular, appears to be especially helpful.

I tend to recommend natural dietary fiber in the form of vegetables and whole grains (primarily insoluble fiber), as well as legumes (soluble fiber to help reduce cholesterol and blunt glucose absorption). No studies are available to endorse the advice to avoid seeds and nuts; a survey of colorectal surgeons showed that half believed eating these foods made no difference in the disease course.

It is noteworthy that acute diverticulitis is treated with clear liquids and a low-fiber diet during the exacerbation. This therapy is based on experience and conventional wisdom, and while there is no convincing evidence to support it, I still adhere to this recommendation.

David M. Schneider, MD
Sutter Santa Rosa Family Medicine Residency Program

9. PEPID

content updating

1. Do you recommend that PEPID get updated on this topic?

No, this topic is current, accurate, and up to date.

PEPID is probably correct NOT to include recommendations for diet modifications to prevent diverticular complications.

2. Is there an EBM Inquiry (HelpDesk Answers or Clinical Inquiries) as indicated by the EB icon (EB) that should be updated on the basis of the review?

Yes, there is important evidence or recommendations that are missing.

SECTION 4: CONCLUSIONS

1. Validity: How well does the study minimize sources of internal bias and maximize internal validity? Give one number on a scale of 1 to 7 (1=extremely well; 4=neutral; 7=extremely poorly)

3

2. If 4.1 was coded as 4, 5, 6, or 7, please describe the potential bias and how it could affect the study results. Specifically, what is the likely direction in which potential sources of internal bias might affect the results?

There does not appear to be a dose-response relationship (in either direction) between consumption and complication rate. I would expect one.

Only men were enrolled in this study.

3. Relevance: Are the results of this study generalizable to and relevant to the health care needs of patients cared for by “full scope” family physicians? Give one number on a scale of 1 to 7 (1=extremely well; 4=neutral; 7=extremely poorly)

3

4. If 4.3 was coded as 4, 5, 6, or 7, please provide an explanation.

I wouldn't be prepared to generalize this to female patients, without first being convinced that there is no reason to suspect that men and women are different with respect to diverticular disease.

5. Practice-changing potential:

2

If the findings of the study are both valid and relevant, does the practice that would be based on these findings represent a change from current practice? Give one number on a scale of 1 to 7

(1=definitely a change from current practice; 4=uncertain; 7=definitely not a change from current practice)

6. If 4.5 was coded as 1, 2, 3, or 4 please describe the potential new practice recommendation. Please be specific about what should be done, the target patient population and the expected benefit.

Who started the recommendation to avoid seeds and nuts in the first place?

7. Applicability to a Family Medical Care Setting:

2

Is the change in practice recommendation something that could be done in a medical care setting by a family physician (office, hospital, nursing home, etc), such as a prescribing a medication, vitamin or herbal remedy; performing or ordering a diagnostic test; performing or referring for a procedure; advising, educating or counseling a patient; or creating a system for implementing an intervention? Give one number on a scale of 1 to 7 (1=definitely could be done in a medical care setting; 4=uncertain; 7=definitely could not be done in a medical care setting)

8. If you coded 4.7 as a 4, 5, 6, or 7, please explain.

9. Immediacy of

1

Implementation: Are there major barriers to immediate implementation? Would the cost or the potential for

reimbursement prohibit implementation in most family medicine practices? Are there regulatory issues that prohibit implementation? Is the service, device, drug or other essentials available on the market? Give one number on a scale of 1 to 7 (1=definitely could be immediately applied; 4=uncertain; 7=definitely could not be immediately applied)
10. If you coded 4.9 as 4, 5, 6, or 7, please explain why.

11. Clinical meaningful outcomes or patient-oriented outcomes: Are the outcomes measured in the study clinically meaningful or patient oriented? Give one number on a scale of 1 to 7 (1=definitely clinically meaningful or patient oriented; 4=uncertain; 7=definitely not clinically meaningful or patient oriented)
12. If you coded 4.11 as a 4, 5, 6, or 7, please explain why.

13. In your opinion, is this a Pending PURL? Give one number on a scale of 1 to 7 (1=definitely a Pending PURL; 4=uncertain; 7=definitely not a Pending PURL)

Criteria for a Pending PURL:

- Valid: Strong internal scientific validity; the findings appears to be true.
- Relevant: Relevant to the practice of family medicine
- Practice changing: There is a specific identifiable new practice recommendation that is applicable to what family physicians do in medical care settings and seems different than current practice.
- Applicability in medical setting:
- Immediacy of implementation

14. Comments on your response in 4.13 Assuming that this is valid (see my questions above about dose-response relationship and the appropriateness of this experimental design to answer the question most frequently encountered in clinical practice), I think this is a PURL. Caveats are that we probably can't generalize to women. Also, this is a cohort study, so it's not the best study to answer the question. I'm not sure that an RCT for this topic is feasible, however, given that no one would be likely to fund a study large enough to demonstrate a difference between nuts and no-nuts for a condition with a low incidence in the first place.

SECTION 5: EDITORIAL DECISIONS

1. FPIN PURLs editorial decision (select one) Pending PURL Review—Schedule for Review

2. Follow-up issues for Pending PURL Reviewer REVIEW SERMO POLL RESULTS

3. FPIN PURLS Editor making decision Bernard Ewigman

4. Date of decision September 18, 2008

5. Brief summary of decision It is a longstanding recommendation that patients with diverticulosis avoid nuts and seeds despite the lack of evidence supporting this recommendation. This large cohort study suggests that there is no role for this recommendation. I don't see why this would not apply to females. I also agree that an RCT will never be done. Who would fund it, and why? Generally cohort study data will show an association that may or may not be confirmed in RCTs. Negative associations or no association cohort studies rarely if ever are subsequently shown to be cause-and-effect relationships in RCTs. I think these cohort data are good enough to recommend to physicians who are still counseling avoidance of nuts and seeds to stop doing so, because they may be making patients unnecessarily miserable (or more likely guilty when they eat nuts and seeds anyway).

SECTION 6: SURVEY QUESTIONS FOR SERMO, PURLS INSTANT POLLS, AND OTHER SURVEYS

1. Current Practice Question for Surveys Do you advise otherwise healthy patients with diverticulosis to avoid nuts, corn, or popcorn?
 Never
 Rarely
 Often
 Always

There is already a Sermo Poll that asks the following:
Do you recommend avoidance of any particular foods in patients with diverticular disease?