Cranberry Juice versus Placebo as Prophylaxis for Recurrent Urinary Tract Infection (UTI) in Adult Women

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INTRODUCTION

- Up to 60% of women will develop a urinary tract infection (UTI) in their lifetime.[1]
- Treatment for infection and prophylaxis typically consists of antibiotic therapy. This protocol has proven to be very effective, but reliance upon it has led to increasing microbial resistance.
- It is imperative that a reliable alternative to antibiotic treatment be developed for UTI prophylaxis that will allow physicians to reserve antibiotics for the most severe cases.
- The American cranberry is a well-known folk remedy for treating UTIs that has seen limited application in clinical practice. It is thought that proanthocyanidin, a component of cranberry juice, prevents bacteria from adhering to the epithelium of the urinary tract and causing infection.[2]
- Recent studies have begun investigating the effectiveness of cranberry juice as prophylactic treatment for recurrent UTIs, may soon build towards a consensus upon which clinicians can act.

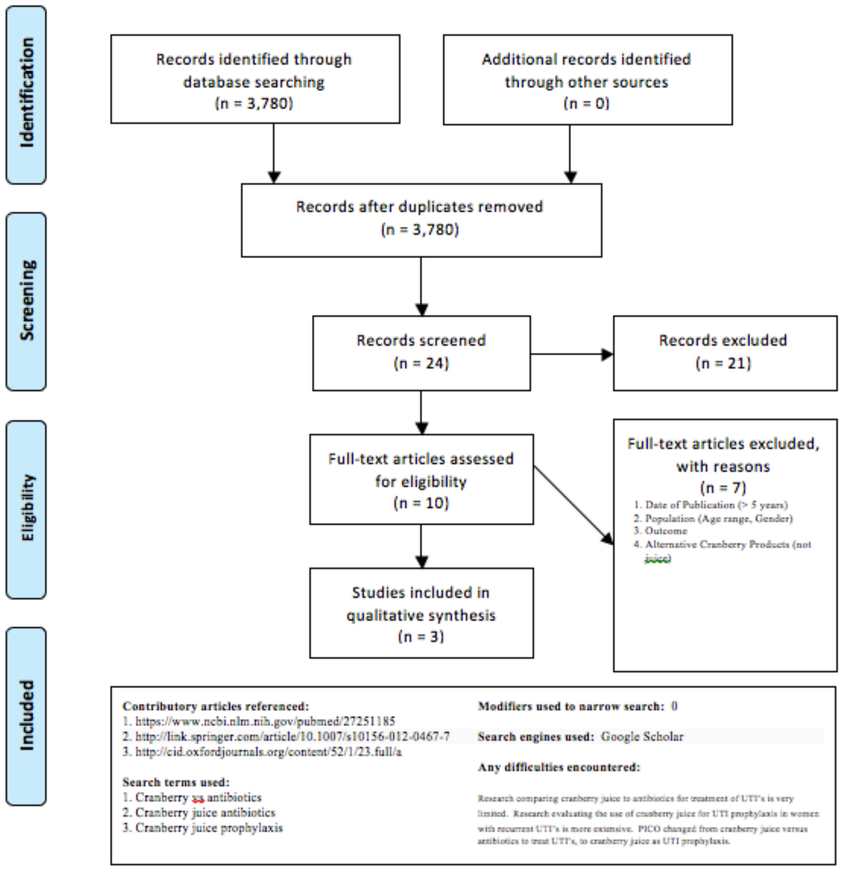
CLINICAL QUESTION

Among adult women with a history of recurrent UTI, does a daily dose of cranberry juice as compared to placebo reduce the UTI recurrence rate in a six-month period?

METHODS

Figure 1

PRISMA Flow Diagram



RESULTS

STUDY 1: *Consumption of a Cranberry Juice Beverage Lowered the Number of Clinical Urinary Tract Infection Episodes in Women with a Recent History of Urinary Tract Infection. Maki et al.*[1]

CRITIQUE:

- **Strengths:** Large, randomized double-blind study with strong compliance. Anticipated difficulties with compliance accordingly. Use of Ocean Spray products generates useful information about the effectiveness of a product to which the general population has access.
- **Weaknesses:** Possible recall bias due to self-reporting of past UTI.

STUDY 2: *A Randomized Clinical Trial to Evaluate the Preventive Effect of Cranberry Juice (UR65) For Patients with Recurrent Urinary Tract Infection. Takahashi et al.*[3]

CRITIQUE:

- **Strengths:** Randomized, double-blind study.
- **Weaknesses:** Poorly explained methodology. Insufficient inclusion/exclusion criteria. Unclear if cranberry juice used is available to general popualtion.

STUDY 3: *Cranberry Juice Fails to Prevent Recurrent Urinary Tract Infection: Results From a Randomized Placebo-Controlled Trial. Barbosa-Cesnik et al.*[2]

CRITIQUE:

- **Strengths:** Detailed treatment and protocol with strong compliance. Use of Ocean Spray products generates useful information about the effectiveness of a product to which the general population has access.
- **Weaknesses:** Representation limited to college-age women. Testing distinguishability of cranberry juice vs. placebo should have been done to minimize placebo effect.

Table 1: Overall Comparison of Reviewed Studies

	Study #1	Study #2	Study #3
Authors	Maki et al.	Takahashi et al.	Barbosa-Cesnik et al.
Design	Double-blinded RCT	Double-blinded RCT	Double-blinded RCT
Population size (n)	n= 373	n= 213	n= 319
(Study, Placebo)	(185, 188)	(107, 106)	(155, 164)
Age range participants	21-70 years	20-79 years	18-40 years
Average age *Median age	40.9 years	55 years* (study group) 59 years* (placebo)	21 years
Amount cranberry juice	240 mL once a day for 24 weeks	125 mL once a day for 24 weeks	240 mL twice a day for six months
[Proanthocyanidin]	119 ±16.9 mg/240 mL	>40 mg/125 mL	112 ± 14.1 mg/240 mL
Diagnostic criteria for recurrent UTI	Presence of dysuria, urinary urgency, frequency, and/or suprapubic pain	Not specified	Presence of UTI symptoms and positive uropathogen culture from urine, vaginal, or rectal specimen
Primary outcome	Clinical UTI incidence density (number UTI events/time)	UTI relapse rate	UTI relapse rate
Results	Significant reduction in UTI incidence density (p=0.017)	No significant difference in overall UTI relapse rates (p=0.42) Significant difference in subjects >50 y (p=0.042)	No significant difference in UTI relapse rates (p=0.21)

RESULTS

***Figure 2**: Difference between cumulative non-relapse rates in Group A (Cranberry Juice Group) and Group P (Placebo Group) in the participants 50 years of age or older with acute uncomplicated cystitis (Log-Rank Test, p = .0425)*

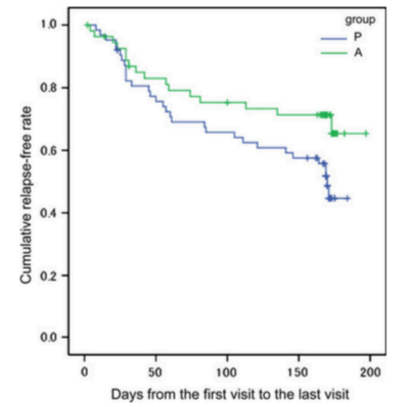
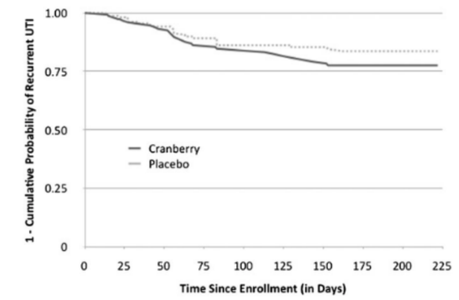


***Figure #3**: Kaplan Meier curves of survival to UTI recurrence for groups receiving Cranberry Juice versus Placebo Juice (Log-Rank Test, p = .21)*



CONCLUSIONS

- There is significant heterogeneity among published studies that evaluate the use of cranberry juice as prophylaxis for recurrent UTI
- The worth and subsequent use of cranberry juice as preventive treatment for UTIs should be guided by studies with populations that closely resemble the patient.
- For women with a history of recurrent UTI, more information is needed in order to definitively recommend or refute cranberry juice as prophylactic therapy.

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2. Barbosa-Cesnik C, Brown MB, Buxton M, Zhang L, DeBusscher J, Foxman B. Cranberry juice fails to prevent recurrent urinary tract infection: Results from a randomized placebo-controlled trial. Clinical Infectious Diseases. 2011;52(1):23-30. http://www.ncbi.nlm.nih.gov/pubmed/21148516. doi: 10.1093/cid/ciq073.

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