

SYSTEMATIC REVIEW SRMA

Vitamin & Mineral Supplements in Primary Prevention of Cardiovascular Disease & Cancer

Objectives:

In this session, the learner will:

1. Assess the validity of a therapy systematic review paper.
2. Determine the clinical importance of the results of a valid therapy paper.
3. Address how valid and important results from a therapy paper can be applied to our patient.

Assignment:

Review the enclosed paper and discuss:

1. Are the results of this therapy article valid?
2. Are the results of this therapy study important?
3. Can we apply this valid, important evidence in caring for our patient?

Clinical Scenario:

One fine October afternoon, Ms. Pardee, a 64 yo patient comes in for a yearly check-up with you, her primary care provider. She has a past medical history of mild asthma and arthritis of her knees. After you review her prescription medicines (albuterol inhaler prn and acetaminophen 500 mg BID prn), you move to talking about any over-the-counter or herbal medications she might be using routinely. She denies use of OTC medicines and herbal products, but asks: “My daughter is big on vitamins and supplements, and was telling me to start taking multivitamin tablets daily because she read somewhere that it can prevent cancer and prolong my life. Is that true, doctor?” You’ve never recommended multivitamins to your patients, but have also not objected to their taking it. Nevertheless, you want to provide the best possible answer to your patient and also learn about the current evidence for multivitamins.

Search Strategy:

You start your search with PubMed Clinical Queries with the terms “multivitamins mortality” and find several citations for systematic reviews that may be helpful to answer this patient’s question.

1. Fortmann SP, Burda BU, Senger CA, Lin JS, Whitlock EP. An updated systematic evidence review for the U.S. Preventive Services Task Force. *Ann Intern Med.* 2013 Dec 17; 159(12):824-34.
2. Alexander DD, Weed DL, Chang ET, Miller PE, Mohamed MA, Elkayam L. A systematic review of multivitamin-multimineral use and cardiovascular disease and cancer incidence and total mortality. *J Am Coll Nutr.* 2013; 32(5):339-54.
3. Macpherson H, Pipingas A, Pase MP. Multivitamin-multimineral supplementation and mortality: a meta-analysis of randomized controlled trials. *Am J Clin Nutr.* 2013 Feb; 97(2):437-44.

Upon closer review of the titles of the articles, you locate a 2013 *Annals of Internal Medicine* article by Fortmann SP, et al that informed the US Preventive Services Task Force in their guidelines. You decide to review this article.

Enclosed Materials:

In Guyatt G, Rennie D, Meade MO, Cook DJ. Users' Guides to the Medical Literature: A Manual for Evidence-based Clinical Practice. 3rd ed. New York, NY: McGraw-Hill; 2015.

- a. Worksheet for the evaluation of an overview article.
- b. Fortmann SP, Burda BU, Senger CA, Lin JS, Whitlock EP. An updated systematic evidence review for the U.S. Preventive Services Task Force. *Ann Intern Med.* 2013 Dec 17; 159(12):824-34.

Formulas

2x2 table	Event	No Event	N
Experimental	a	b	N for Experimental Group
Control	c	d	N for Control Group

EER = Experimental event rate. $EER = a / a + b$

CER = Control event rate. $CER = c / c + d$

ARR: (*Absolute Risk Reduction; difference in the event rates between control and experimental group, expressed over time*)

$$ARR = |CER - EER|$$

$$ARR = |c/c+d - a/a+b|$$

RRR: (*Relative risk reduction (RRR) is the proportion of baseline risk reduced by the therapy, calculated by dividing the ARR by the absolute risk in the control group (CER), expressed over time. It is larger and more impressive. It is independent of baseline risk*)

$$RRR = 1 - |EER/CER|$$

$$RRR = 1 - [c/c+d - a/a+b]$$

NNT (*Number needed to treat is the number of patients who need to be treated over a specific period of time to prevent one outcome*)

$$NNT = 1 / ARR \text{ (if using fraction) or } 100 / ARR \text{ (if using \%)}$$