Reviewer's report

Title: Physical activity for the prevention and treatment of major chronic disease: an overview of systematic reviews study protocol

Version: 2 Date: 14 June 2013

Reviewer: Paul Shekelle

Reviewer's report:

these are all suggestions for discretionary revisions.

There is one overarching challenge with a review of physical activity interventions to prevent chronic diseases, and that is the long time periods needed to have the effect. So the conceptual model most people use is that the physical activity people are pursuing today while in the 3rd decade of life will, if maintained, help reduce their risk of diabetes, coronary heart disease, osteoarthritis, etc., in the 5th decade. Trying to conduct a randomized trial of this duration of intervention is, I would venture, close to impossible (as opposed to an RCT of 1 year's duration of intervention with 10 years or more of followup - a few such trials exist). So the evidence base for physical activity interventions usually consists of RCTs of perhaps up to a year's duration, and then mostly as treatment for a chronic condition, and epidemiologic studies of one or two decades duration that relate measures of physical activity taken at baseline (and perhaps at regular intervals throughout) and look for associations with the incidence of diseases later on. If this review is to be restricted to RCTs, then one of the results is almost certainly predictable from the start - there will be inadequate or insufficient evidence to reach conclusions about the effect of increasing physical activity at prevention of most of the major chronic diseases (DM, CHD, OA, etc) for general populations of people (i.e., not those selected because they are at unusually high risk). In such case, readers might draw the potentially erroneous conclusion that there is no evidence relating physical activity to chronic disease prevention, which would then reinforce a nihilistic approach to physical activity. In my view, this would be detrimental to good health. The authors text about significance: "This will inform policymakers and clinicians as to the disease conditions in which physical activity interventions...[have]...no clear benefit or lack of evidence" heightens my concern about his kind of conclusion.

So, the authors would be wise to discuss this challenge, and how their review is going to deal with it, and what conclusions they may or may not be able to draw, a priori, before they have searched for and identified and summarized the data.

The authors state they are going to use the I2 statistic to assess for heterogeneity in the outcome. They also state their evidence synthesis will be narrative. Does this mean they are going to restrict their eligibility criteria to only existing systematic review of RCTs that have pooled outcomes that generate an I2 statistic?
I am a bit worried about the plethora of "primary" outcomes. The authors list "prevention of chronic disease and improved outcome, treatment, or management of chronic disease." So let's just consider this to be two outcomes, decreased incidence and better outcomes for management. Then they have heart disease with at least 9 categories, 2 types of cancer, 2 kinds of airway disease, diabetes, and then 7 other conditions (CKD, arthritis, depression, etc.) So this is 21 conditions with 2 outcomes per condition or 42 "primary" outcomes. I don't think 42 outcomes can all be considered primary. The authors may want to give some additional thought to this.

Lastly, knowing this literature to some degree, I think the authors hopes for what can be generalized from their findings (type, intensity, volume, duration, setting....by disease condition and by outcome..."that would result in the maximal patient benefit") is very unlikely to be realized. And there is probably some need for a discussion that physical activity, like cigarette smoking and obesity, are almost certainly challenges better attacked with a public health approach rather than an individual clinician-patient approach.