Reviewer's report

Title: Who will increase their physical activity? An examination of the predictors of change in objectively measured physical activity over 12 months in the ProActive cohort

Version: 1 Date: 23 September 2009

Reviewer: Verity Cleland

Reviewer's report:

General Comments
This study aimed to determine the predictors of change in physical activity (estimated from heart rate monitoring) over one year. It did so in a sample of adults aged 30-50 years who were identified from general practice settings as at risk of diabetes and who were enrolled in a physical activity promotion intervention (ProActive). It is well-written, clearly describes the measures used, the data appear sound, the discussion is thoughtful and discusses the limitations, previous work by the authors is acknowledged and title accurately conveys the study.

Major Compulsory Revisions (which the author must respond to before a decision on publication can be reached)

1. The rationale for the study is not fully developed and requires further work. The first paragraph of the Introduction nicely sets the scene for why we might be interested in examining predictors of change in physical activity, but then we are left hanging a little. The second paragraph of the Introduction section is essentially describing the study and really should be in the Methods section, and the third paragraph of the Introduction appears to be a combination of rationale for predictor measures and a description of the measures used. I suggest moving the second paragraph to the Methods and rewriting the third paragraph so it informs the rationale of the study and leads into the aims and Methods. The authors could develop the story about the lack of studies examining predictors of behaviour change, and talk more about what has been found previously.

2. Could the authors please provide some reassurance that it is appropriate to pool data by trial arm and sex? It is acknowledged that the results were similar across trial arms and by sex, but it still makes me a little nervous when the key outcome is change in physical activity and the study population were involved in a physical activity promotion intervention. Perhaps the authors could describe (or present) the effect of adjusting for trial arm and sex?

3. Following on from comment #2, the authors state in the Discussion that the relationship between alcohol intake at baseline and change in PAEE was confounded by sex, which to me suggests that sex should be included in the linear regression models.
4. In Table 2, it is unclear to me why beta coefficients have been adjusted for baseline PAEE, but the R2 has not. Can the authors please add a rationale for not adjusting for PAEE in the presentation of the R2 or maybe present both adjusted and unadjusted?

5. It would be useful to include discussion about the finding that higher baseline fitness was predictive of increases in PAEE over time – the authors acknowledge that this is a novel finding, but do not discuss further reasons for this result. It may be that those who are more interested in health and physical activity (and therefore may be more fit to begin with) are more receptive to physical activity promotion strategies – a common problem in health promotion strategies, where the people who we most want to target (i.e. the most inactive) are the most difficult to reach and the least responsive to change.

6. Similarly, there is not much discussion around the finding that higher baseline alcohol consumption was predictive of increases in PAEE over time. Did sex explain all of this association, or just part of it? Could the relationship also be confounded by social class?

7. Please report the initial response rate.

Minor Essential Revisions (such as missing labels on figures, or the wrong use of a term, which the author can be trusted to correct)

1. Please add units of measurement or a description of the range of possible answers for fitness, current health status and self-reported physical activity in Table 1.

2. In the first sentence of the fourth Discussion point, ‘predictors’ should be ‘predictor’

3. In Table 1, is HbA1c a proportion or a mean? The row label suggests it is a proportion, but the data suggest a mean and SD. Please clarify.

**Level of interest:** An article whose findings are important to those with closely related research interests

**Quality of written English:** Acceptable

**Statistical review:** No, the manuscript does not need to be seen by a statistician.

**Declaration of competing interests:**

I declare that I have no competing interests