

Aerobic exercise interventions for adults living with HIV/AIDS: Evidence and implications for public health

Review on which this evidence summary is based:

O'Brien, K., Nixon, S., Tynan, A.M., & Glazier, R.H. (2010). *Aerobic exercise interventions for adults living with HIV/AIDS*. *Cochrane Database of Systematic Reviews, Issue 8*, Art. No.: CD001796.

Review Focus

- P** Adults (18 years of age and older) living with HIV
- I** Aerobic exercise performed at least three times per week for at least four weeks including walking, jogging, cycling, rowing, stair stepping, and swimming
- C** Usual care
- O** Immunologic and virologic indicators, cardiopulmonary and psychological measures, strength, weight, and body composition

Review Quality Rating: 10 (strong) *Details on the methodological quality are available [here](#).*

Considerations for Public Health Practice

Conclusions from Health Evidence	General Implications
<p>This high quality review and meta-analysis is based on primary studies of moderate to strong methodological quality.</p> <p>Immunologic/virologic</p> <ul style="list-style-type: none"> significant impact on CD4 count among interval aerobic exercisers vs. non-exercisers no impact on CD4 count, CD4% viral load, and viral load for all other types of exercise vs. non-exercise <p>Cardiopulmonary</p> <ul style="list-style-type: none"> improvement in VO₂ Max no impact on maximum heart rate or exercise time <p>Strength</p> <ul style="list-style-type: none"> improvements in strength in exercisers vs. non-exercisers <p>Weight and Body composition</p> <ul style="list-style-type: none"> decrease in percent body fat in aerobic exercisers vs. non-exercisers increased change in leg muscle area in aerobic exercise plus progressive resistive training vs. no exercise no change in mean body weight, waist or hip circumference, waist-to-hip ratio, BMI, or fat mass <p>Psychological</p> <ul style="list-style-type: none"> improvement in depression-dejection 	<p>The overall findings suggest that</p> <ul style="list-style-type: none"> the promotion of aerobic exercise, while resulting in statistically significant improvements for a small number of outcomes, does not positively impact most outcomes, and may not be an effective public health strategy for this population. Various formats of aerobic exercise did not positively and significantly impact immunologic/virologic outcomes, most cardiopulmonary outcomes, and strength measures. Given there were statistically significant impacts on VO₂ Max, percent body fat, and depression in HIV patients, promotion of exercise may be supported for specific HIV populations. <p>If implemented, the impact of aerobic exercise promotion on this population should be evaluated within the local context.</p>

Evidence and Implications

What's the evidence?	Implications for practice and policy
<p>1. Immunologic/Virologic Outcomes (14 RCTs)</p> <ul style="list-style-type: none"> A statistically significant impact on CD4 count was observed in the interval aerobic group compared to non-exercisers (69.58 cell/mm³, 95% CI, 14.08 to 125.09, P=0.01) (2 studies). 	<p>1. Immunologic/Virologic</p> <ul style="list-style-type: none"> Generally the evidence does not support public health allocating resources to promote aerobic exercise among HIV populations for the purpose of improving CD4 count, CD4%, or viral load.

<ul style="list-style-type: none"> • <u>No impact</u> on change in CD4 count, CD4%, and viral load for all other combinations of exercise versus no exercise. 	
2. Cardiopulmonary (14 RCTs) <ul style="list-style-type: none"> • A statistically significant improvement in VO₂ Max was observed among aerobic exercisers vs. non-exercisers (2.63 MI/kg/min, 95% CI, 1.19 – 4.07); constant aerobic exercisers vs. non-exercisers (2.40 MI/kg/min, 95% CI .82-3.99); heavy intensity vs. moderate intensity (4.30 MI/kg/min, 95% CI 0.67 to 7.98). • <u>No impact</u> on maximum heart rate or exercise time. 	2. Cardiopulmonary <ul style="list-style-type: none"> • Exercise promotion is supported as a public health intervention among HIV populations if improvements in VO₂ Max are of greatest interest. • However, improvements in maximum heart rate and exercise time should not be expected.
3. Strength (6 RCTs) <ul style="list-style-type: none"> • Meta-analysis not conducted due to variation in strength measures. 5 of 6 individual studies reported statistically significant improvements in strength measures between exercisers and non-exercisers. 	3. Strength <ul style="list-style-type: none"> • While meta-analysis was not possible, the evidence suggests that exercise promotion is supported to achieve improved strength among HIV populations.
4. Weight and Body Composition (9 RCTs) <ul style="list-style-type: none"> • Statistically significant decrease in percent body fat (-1.12%, 95% CI -2.18 to -0.07) and increase in change in leg muscle area (4.79cm², 95% CI 2.04 to 7.54). • <u>No impact</u> change in mean body weight, waist or hip circumference, waist-to-hip ratio, BMI, or fat mass. 	4. Weight and Body Composition <ul style="list-style-type: none"> • While the majority of outcomes for weight and body composition were not impacted by aerobic exercise, improvement in percent body fat suggests promotion of aerobic exercise among HIV populations may be an important public health strategy.
5. Psychological (9 RCTs) <ul style="list-style-type: none"> • Statistically significant improvement in depression-dejection scale in exercisers vs. non-exercisers (7.68, 95% CI -13.47 to -1.90). 	5. Psychological <ul style="list-style-type: none"> • The evidence suggests the promotion of aerobic exercise among HIV populations for improving depression-dejection measures.
Legend: P – Population; I – Intervention; C – Comparison group; O – Outcomes; CI – Confidence Interval; OR – Odds Ratio; RR – Relative Risk **For definitions please see the healthevidence.org Glossary http://www.healthevidence.org/glossary.aspx	

Why this issue is of interest to public health in Canada

HIV attacks the immune system, resulting in a chronic, progressive illness that leaves infected individuals vulnerable to opportunistic infections and cancers.¹ The median time from being infected with HIV to being diagnosed with AIDS now exceeds 10 years.¹ However, AIDS remains incurable.² The number of people estimated to be living with HIV/AIDS in Canada is increasing. At the end of 2005, an estimated 58 000 (48 000-68 000) Canadians were living with HIV/AIDS, which represented an increase of almost 16% from 2002.³ A considerable number of people living with HIV (PLWH) do not consistently practice HIV risk reduction behaviours, thereby placing others at risk for HIV infection, and themselves at risk for STIs.⁴ Thus, there is a significant need for prevention interventions to reduce HIV risk behaviours amongst PLWH. The provision of such interventions may prevent numerous HIV infections (and other STIs), and as a result may also help prevent the evolution and spread of drug resistance.⁴ It is important that the best-evidence on behavioural prevention interventions be identified and widely implemented.²

1. Health Canada. (2006). *HIV and AIDS*. Retrieved from <http://www.hc-sc.gc.ca/hl-vs/iyh-vsv/diseases-maladies/hiv-vih-eng.php>
2. Lyles, C.M., Kay, L.S., Crepaz, N., Herbst, J.H., Passin, W.F., Kim, A.S., Rama, S.M., Thadiparthi, S., DeLuca, J.B., Mullins, M.M. (2007). Best-evidence interventions: Findings from a systematic review of HIV behavioural interventions for US populations at high risk, 2000-2004. *American Journal of Public Health, 97*(1), 133-143.
3. Public Health Agency of Canada. (2006). *HIV/AIDS Epidemiology Updates, August 2006*. Surveillance and Risk Assessment Division, Centre for Infectious Disease Prevention and Control, Public Health Agency of Canada.
4. Crepaz, N., Lyles, C.M., Wolitski, R.J., Passin, W.F., Rama, S.M., Herbst, J.H., Purcell, D.W., Malow, R.M., Stall, R., HIV/AIDS Prevention Research Synthesis (PRS) Team. (2006). Do prevention interventions reduce HIV risk behaviours among people living with HIV? A meta-analytic review of controlled trials. *AIDS, 20*(2), 143-57.

Other quality reviews on this topic are available on www.healthevidence.org

Suggested citation

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This evidence summary was written to condense the work of the authors of the review referenced on page one. The intent of this summary is to provide an overview of the findings and implications of the full review. For more information on individual studies included in the review, please see the review itself. The opinion and ideas contained in this document are those of the evidence summary author(s) and healthevidence.org. They do not necessarily reflect or represent the views of the author's employer or other contracting organizations. Links from this site to other sites are presented as a convenience to healthevidence.org internet users. Healthevidence.org does not endorse nor accept any responsibility for the content found at these sites.