

## JOURNAL WATCH

Our expert highlights the most important research articles across the spectrum of topics relevant to the field of diabetes management

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**Umpierre D, Ribeiro PA, Kramer CK *et al.* Physical activity advice only or structured exercise training and association with HbA1c levels in Type 2 diabetes: a systematic review and meta-analysis. *JAMA* 305(17), 1790–1799 (2011).**

It is known that regular exercise improves glucose control in diabetes. However, the impact of different exercise training interventions on glucose control is unclear. In this study, a systematic review and meta-analysis of randomized controlled trials (RCTs) assessing associations of structured exercise training regimens (aerobic, resistance or both) and physical activity advice with or without dietary co-intervention on change in hemoglobin A1c (HbA1c) in Type 2 diabetes patients was executed. Up to February 2011, RCTs of at least 12 weeks' duration that evaluated the ability of structured exercise training or physical activity advice to lower HbA1c levels as compared with a control group in patients with Type 2 diabetes were searched. Of 4191 articles retrieved, 47 RCTs (8538 patients) were included. Overall, structured exercise training (23 studies) was associated with a decline in HbA1c level (-0.67%) compared with control participants. In addition, structured aerobic exercise (-0.73%), structured resistance training (-0.57%) and both combined (-0.51%) were each associated with declines in HbA1c levels compared with control participants. Structured exercise durations of more than

150 min per week were associated with HbA1c reductions of 0.89%, while structured exercise durations of 150 min or less per week were associated with HbA1c reductions of 0.36%. Overall, interventions of physical activity advice (24 studies) were associated with lower HbA1c levels (-0.43%) compared with control participants. Combined physical activity advice and dietary advice was associated with decreased HbA1c (-0.58%) as compared with control participants. Physical activity advice alone was not associated with HbA1c changes. Structured exercise training that consists of aerobic exercise, resistance training or both combined is associated with HbA1c reduction in patients with Type 2 diabetes. Structured exercise training of more than 150 min per week is associated with greater HbA1c declines than that of 150 min or less per week. Physical activity advice is associated with lower HbA1c, but only when combined with dietary advice.

**Chudyk A, Petrella RJ. Effects of exercise on cardiovascular risk factors in Type 2 diabetes: a meta-analysis. *Diabetes Care* 34(5), 1228–1237 (2011).**

Exercise is a cornerstone of diabetes management and the prevention of incident diabetes. However, the impact of the mode of exercise on cardiovascular (CV) risk factors in Type 2 diabetes is unclear. A systematic review of the literature up to October 2009 was executed for the effect



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of aerobic or resistance exercise training on clinical markers of CV risk: glycemic control, dyslipidemia, blood pressure and body composition in patients with Type 2 diabetes. Of 645 articles retrieved, 34 met the inclusion criteria; most investigated aerobic exercise alone, and 10 reported combined exercise training. Aerobic exercise alone or combined with resistance training significantly improved HbA1c (-0.60 and -0.67%, respectively), systolic blood pressure (-6.08 and -3.59 mmHg, respectively) and triglycerides (-0.3 mmol/l). Waist circumference was significantly improved (-3.1 cm) with combined aerobic and resistance exercise, although fewer studies and more heterogeneity of the responses were observed in the latter two markers. Resistance exercise alone or combined with any other form of exercise was not found to have any significant effect on CV markers. Aerobic exercise alone or combined with resistance training improves glycemic control, systolic blood pressure, triglycerides and waist circumference. The impact of resistance exercise alone on CV risk markers in Type 2 diabetes remains unclear.

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**Katula JA, Vitolins MZ, Rosenberger EL et al. One-year results of a community-based translation of the diabetes prevention program: Healthy-Living Partnerships to Prevent Diabetes (HELP PD) Project. *Diabetes Care* 34(7), 1451–1457 (2011).**

Although the Diabetes Prevention Program (DPP) and the Finnish Diabetes Prevention Study (FDPS) demonstrated that weight loss from lifestyle change reduces Type 2 diabetes incidence in patients with prediabetes, the translation into community settings has been difficult. The objective of this study was to report the first-year results of a community-based translation of the DPP lifestyle weight

loss (LWL) intervention on fasting glucose, insulin resistance and adiposity. A total of 301 overweight and obese volunteers (BMI: 25–40 kg/m<sup>2</sup>) with fasting blood glucose values between 95 and 125 mg/dl were randomly assigned to a group-based translation of the DPP LWL intervention administered through a diabetes education program and delivered by community health workers (CHWs) or to an enhanced usual-care condition. CHWs were volunteers with well-controlled Type 2 diabetes. A total of 42.5% of participants were male, the mean age was 57.9 years, 26% were of a race/ethnicity other than white, and 80% reported having an education beyond high school. The primary outcome was mean fasting glucose over 12 months of follow-up, adjusting for baseline glucose. Compared with usual-care participants, LWL intervention participants experienced significantly greater decreases in blood glucose (-4.3 vs -0.4 mg/dl;  $p < 0.001$ ), insulin (-6.5 vs -2.7  $\mu$ U/ml;  $p < 0.001$ ), homeostasis model assessment of insulin resistance (-1.9 vs -0.8;  $p < 0.001$ ), weight (-7.1 vs -1.4 kg;  $p < 0.001$ ), BMI (-2.1 vs -0.3 kg/m<sup>2</sup>;  $p < 0.001$ ) and waist circumference (-5.9 vs -0.8 cm;  $p < 0.001$ ). This translation of the DPP intervention conducted in community settings, administered through a diabetes education program, and delivered by CHWs holds great promise for the prevention of diabetes by significantly decreasing glucose, insulin and adiposity.

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*The author has no relevant affiliations or financial involvement with any organization or entity with a financial interest in or financial conflict with the subject matter or materials discussed in the manuscript. This includes employment, consultancies, honoraria, stock ownership or options, expert testimony, grants or patents received or pending, or royalties.*

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