Major journals

ANNALS OF INTERNAL MEDICINE

Glycaemic control improved greatly by aerobic exercise and resistance training

Readability	✓✓✓✓
Applicability to practice	✓✓✓✓
WOW! factor	✓✓✓✓✓

1 The authors investigated the combined effect of aerobic and resistance training on HbA_{1c} in people with type 2 diabetes.

2 In a randomised controlled trial, 251 adults (39–70 years old) who had clearance by a cardiologist or a negative stress test result began aerobic training, resistance training or both.

3 Exercise was undertaken 3 times a week for 22 weeks.

4 Compared with sedentary controls, the absolute change in HbA_{1c} for the aerobic exercise group was -0.51 % (95 % CI: -0.87 to -0.14).

5 In the resistance training group, HbA_{1c} decreased by -0.38 % compared with controls (95 % CI: -0.72 to -0.22).

6 Combined exercise had a synergistic effect, resulting in an additional reduction in HbA_{1c} of -0.46 % (95 % CI: -0.83 to -0.09) compared with aerobic training alone and -0.59 % (95 % CI: -0.59 to -0.23) compared with resistance training alone.

7 Blood pressure and lipid values did not differ significantly between groups.

8 While the results demonstrate a clear benefit of exercise, it is unclear what effect will result when people are less adherent to exercise programmes. It is also worth noting that the people in this study who undertook combined exercise did more in total.

Sigal RJ, Kenny GP, Boulé NG et al (2007) Effects of aerobic training, resistance training, or both on glycemic control in type 2 diabetes: a randomized trial. *Annals of Internal Medicine* **147**: 257–69

Lifestyle works… but keep taking the tablets!

Vinod Patel, Consultant Physician at the George Eliot Hospital, Nuneaton, and Associate Professor at the University of Warwick

The evidence base in the literature for the lifestyle advice we give to our patients is, unfortunately, an empty box in my brain – one day to be populated with high-quality randomised controlled trials. I feel considerably more comfortable around the larger randomised controlled trials in lipid, hypertension and glycaemic care. One such trial that is worthy of inclusion in my empty box is this study by Sigal et al (summarised alongside), who investigated the effect of exercise on HbA_{1c} in people with type 2 diabetes.

This randomised controlled trial was based in eight community care centres in Canada and studied 251 people with type 2 diabetes. The age range was 39–70 years and people were randomised to one of four groups: sedentary control, aerobic exercise, resistance exercise or a combination of aerobic and resistance exercise. The effects on HbA_{1c} were striking and statistically significant. Compared with controls, aerobic exercise reduced HbA_{1c} by 0.51 percentage points, resistant exercise reduced it by 0.38 percentage points, and HbA_{1c} decreased by 0.99 percentage points with a combination of the two. There were no significant changes in BP or lipid profiles in any of the groups.

It is important to note that the 'adverse events', particularly musculoskeletal, were significantly higher in the exercise groups overall. Generalisation of the data has to be tempered by the fact that a 4-week run-in period to the study resulted in a significant minority of people excluding themselves from further involvement.

The level of improvement in HbA_{1c} of 0.99 % in a randomised controlled trial is important. However, the long-term effect of exercise does remain unknown at present. To implement these findings, an exercise advisor will be needed – a role that PCTs can ill afford for the 2 million people with diabetes in the UK. This role will therefore need to be undertaken by all healthcare professionals in diabetes care, individualised for the appropriate patients.

Other papers reviewed in this section show that close attention to lifestyle (diet, alcohol moderation, being physically active, not smoking, healthy weight) has the potential to reduce myocardial infarctions by 77 % (Akesson et al, 2007, see overleaf). Pedometers work too, with a BP reduction of 3.2 mmHg and BMI reduction of 0.38 kg/m^2 (Bravata et al, 2007, see overleaf). Medication non-adherence was found to be associated with a 2-fold increased risk of CVD events in people with established coronary heart disease (Gehi et al, 2007, see overleaf).

The message is clear. Lifestyle works… but keep taking the tablets!

'Low-risk diet with moderate alcohol and three low-risk lifestyle behaviours (nonsmoking, waist–hip ratio in the 75th percentile and physical activity > 40 minutes a day) decreased MI risk by 92 % compared with women without low-risk diet and lifestyle patterns.'

ARCHIVES OF INTERNAL MEDICINE

Medication non-adherence leads to a 2-fold increase in CV event risk

Readability	✓✓✓✓✓
Applicability to practice	✓✓✓✓
WOW! factor	✓✓✓✓

1 In people with cardiovascular disease, non-adherence to treatment can cause adverse outcomes and increased healthcare costs.

2 The authors looked at the risk of cardiovascular outcomes in 1015 people with coronary heart disease who reported their adherence to treatment.

3 All participants were asked: 'In the past month, how often did you take your medications as the doctor prescribed?'

4 Non-adherence was defined as taking medications correctly 75 % of the time or less.

5 During a 3.9-year follow up, events such as coronary heart disease death, MI or stroke were recorded.

6 Non-adherence was reported by 83 (8.2 %) people. Cardiovascular events occurred in 146 (14.4 %).

7 During follow up, people who did not report medication adherence were more likely to develop cardiovascular events than those who followed instructions (22.9 % vs 13.8 %; $P = 0.03$).

8 Non-adherence remained a significant risk factor for cardiovascular events when baseline cardiac disease severity, traditional risk factors and depressive symptoms were controlled for (HR: 2.3; 95 % CI: 1.3–4.3; $P = 0.006$).

Gehi AK, Ali S, Na B, Whooley MA (2007) Self-reported medication adherence and cardiovascular events in patients with stable coronary heart disease: the heart and soul study. *Archives of Internal Medicine* **167**: 1798–803

'Medication non-adherence leads to a 2-fold increase in CV event risk.'

ARCHIVES OF INTERNAL MEDICINE

MIs in women are preventable by healthy diet and lifestyle

Readability	✓✓✓✓
Applicability to practice	✓✓✓✓
WOW! factor	✓✓✓✓

1 Factor analysis was used to identify dietary behaviour in 24 444 postmenopausal women who did not have cancer, cardiovascular disease or diabetes at baseline.

2 MI was diagnosed in 308 people during the 6.2-year study. The dietary patterns 'healthy' and 'alcohol' were associated with decreased MI risk.

3 Low-risk diet (vegetables, fruit, wholegrains, fish and legumes) with moderate alcohol (5 g per day) and three low-risk lifestyle behaviours (nonsmoking, waist–hip ratio in the 75th percentile and physical activity > 40 minutes a day) decreased MI risk by 92 % compared with women without low-risk diet and lifestyle patterns.

4 Just 5 % of the study population had these healthy behaviours; 77 % of MIs could have been prevented had all participants followed dietary and lifestyle advice.

Akesson A, Weismayer C, Newby PK, Wolk A (2007) Combined effect of low-risk dietary and lifestyle behaviors in primary prevention of myocardial infarction in women. *Archives of Internal Medicine* **167**: 2122–7

JAMA

Pedometer use promotes physical activity

Readability	✓✓✓✓✓
Applicability to practice	✓✓✓✓✓
WOW! factor	✓✓✓✓

1 A meta-analysis of 26 studies with a total of 2767 participants showed that pedometer users increased their physical activity (by 2491 steps a day more than controls in the 8 randomised controlled trials; $P < 0.001$, and by 2183 steps a day in the 18 observational studies; $P < 0.0001$).

2 Overall, pedometer use increased physical activity by 26.9 % and having a 'step goal' was a significant predictor ($P = 0.001$).

3 Overall, pedometer use decreased BMI by 0.38 kg/m^2 ($P = 0.03$) and systolic blood pressure by 3.8 mmHg ($P < 0.001$).

Bravata DM, Smith-Spangler C, Sundaram V et al (2007) Using pedometers to increase physical activity and improve health: a systematic review. *JAMA* **298**: 2296–304

ARCHIVES OF INTERNAL MEDICINE

Overweight may increase CHD risk

Readability	✓✓✓
Applicability to practice	✓✓✓✓
WOW! factor	✓✓✓

1 Relative risks of CHD were calculated for 302 296 people to assess the impact of overweight (BMI: 25.0–29.9 kg/m^2) and obesity (BMI: >30.0 kg/m^2).

2 In total, 18 000 CHD events occurred.

3 Relative risks for overweight and obesity compared with normal weight were 1.32 (1.24–1.40) and 1.81 (1.56–2.10), respectively, adjusting for age, sex, smoking status and physical activity.

Additional adjustment for BP and cholesterol levels reduced the relative risks to 1.17 (1.11–1.23) and 1.49 (1.32–1.67), respectively.

5 An increase in BMI of 5 units was associated with a relative risk of 1.29 (1.22–1.35) before and 1.16 (1.11–1.21) after adjustment for BP and cholesterol levels.

Bogers RP, Bemelmans WJ, Hoogenveen RT et al (2007) Association of overweight with increased risk of coronary heart disease partly independent of blood pressure and cholesterol levels: a meta-analysis of 21 cohort studies including more than 300 000 persons. *Archives of Internal Medicine* **167**: 1720–8