

Diabetes journals

DIABETES CARE

Regular physical activity decreases the risk of T2D

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

1 Although it is known that physical inactivity is a contributing cause of T2D, there are no studies on long-term trends in cardiorespiratory fitness and risk of developing T2D.

2 The study participants were 4187 Japanese men without diabetes (mean age, 32 years) who received annual health checks.

3 Fitness was assessed using a submaximal exercise test on a cycle ergometer; each man was assessed a mean six times over 7 years. The median follow-up was 14 years; during this time, 274 men developed T2D.

4 A simple linear regression assessed each person's regression coefficient (slope) of fitness over 7 years; results were used to divide the men into quartiles.

5 Over 7 years, men in the lowest fitness quartile decreased in fitness (average Vo_{2max} decreased from 45.3 to 36.6 mL/kg/min, median slope -1.25 mL/kg/min); men in the highest fitness quartile increased in fitness (average Vo_{2max} increased from 36.3 to 45.6 mL/kg/min, median slope 1.33 mL/kg/min).

6 The men in the lowest fitness quartile had the highest level of fitness at the beginning of the study (1979); men in the highest fitness quartile had the lowest initial fitness.

7 Men with higher initial fitness had lower hazard ratios for T2D than men in the lower initial fitness group; men in the highest quartile of fitness group had an approximately 70% lower risk of developing T2D compared with those in the lowest quartile.

Sawada SS, Lee I-M, Naito H et al (2010) Long-term trends in cardiorespiratory fitness and the incidence of type 2 diabetes. *Diabetes Care* **33**: 1353–7

Strong evidence for higher levels of fitness reducing the risk of diabetes



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Numerous previous studies have suggested an increase in the incidence of type 2 diabetes with reduced cardiorespiratory fitness (La Monte et al, 2005; Jeon et al, 2007). Most of these studies have used single assessments of cardiorespiratory fitness to predict lower incidences of type 2 diabetes. There has been no long-term data examining trends in fitness and the risk of type 2 diabetes. Consequently, the article by Sawada et al (2010; summarised alongside) is an extremely helpful study of more than 4000 Japanese men without diabetes.

Sawada et al demonstrated, not surprisingly, that men in the lowest fitness quartile decreased their fitness in the long

term and demonstrated a doubling in the incidence of type 2 diabetes when adjusted for age, initial fitness level, BMI, systolic blood pressure, cigarette smoking, alcohol intake and family history of diabetes. Those who increased in fitness over the 7-year study period halved their of incidence of diabetes.

These results demonstrate what is not likely to be surprising to diabetologists: an increase in long-term fitness reduces the incidence of type 2 diabetes. Consequently, the findings of Sawada et al should have an impact on the planning of lifestyle change for the avoidance of later diabetes diagnosis.

“... the findings of Sawada et al should have an impact on the planning of lifestyle change for the avoidance of later diabetes diagnosis.”

Jeon CY, Lokken RP, Hu FB, van Dam RM (2007) Physical activity of moderate intensity and risk of type 2 diabetes: a systematic review. *Diabetes Care* **30**: 744–52

La Monte MJ, Blair SN, Church TS (2005) Physical activity and diabetes prevention. *J Appl Physiol* **99**: 1205–13

DIABETES CARE

Intensive lifestyle intervention reduced costs and CVD risk factors

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

1 The Look AHEAD (Action for Health in Diabetes) study was devised to determine whether the effects of an intensive lifestyle intervention (ILI) on weight reduction and increased physical activity would affect medication use for cardiovascular disease (CVD) risk factors in people with T2D.

2 Complete data were obtained for 4998 overweight or obese people with T2D (aged 45–76) who were randomised to receive an ILI ($n=2496$) or usual diabetes support and education (DSE; $n=2502$) for 1 year; medication requirements for diabetes, hypertension and hyperlipidaemia were established at baseline and study end.

3 People in the ILI group had significantly reduced CVD risk factors at 1 year compared with those in the DSE group ($P<0.0001$).

4 The authors concluded that ILI greatly improved CVD risk factors, with associated reduced medication use and cost. Redmon JB, Bertoni AG, Connelly S et al (2010) Effect of the Look AHEAD study intervention on medication use and related cost to treat cardiovascular disease risk factors in individuals with type 2 diabetes. *Diabetes Care* **33**: 1153–8

“Results suggest the need for early preventive measures to improve glucose metabolism to combat diastolic dysfunction and diastolic heart failure.”

DIABETOLOGIA

Glucose metabolism linked with diastolic dysfunction and HF

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

- 1 Previous studies have linked diabetes to abnormalities in left ventricular relaxation and compliance, diastolic dysfunction and heart failure (HF) with normal ejection fraction.
- 2 The investigators of this study aimed to determine the link between glucose metabolism and diastolic dysfunction across a range of metabolic states, including normal glucose metabolism, prediabetes and T2D treated intensively with insulin or with oral glucose-lowering therapy.
- 3 Participants were from the Diagnostic Trial on Prevalence and Clinical Course of Diastolic Dysfunction and Diastolic Heart Failure study, which included people with risk factors for HF.
- 4 This study comprised 1085 participants: 343 had normal glucose metabolism; 229 had prediabetes; 335 had non-insulin-treated T2D; and 178 had insulin-treated T2D.
- 5 Diastolic dysfunction significantly worsened with impairment in glucose metabolism ($P < 0.001$); the prevalence was 87.3% in people with T2D treated with insulin, 88.4% in those with T2D on oral glucose-lowering therapy; 86.7% in those with prediabetes; and 76% in those with normal glucose metabolism.
- 6 Multivariate logistic regression analysis showed that glucose metabolism status was significantly associated with prevalence of diastolic dysfunction.
- 7 Results suggest the need for early preventive measures to improve glucose metabolism to combat diastolic dysfunction and diastolic HF.

Stahrenberg R, Edelmann F, Mende M et al (2010) Association of glucose metabolism with diastolic function along the diabetic continuum. *Diabetologia* **53**: 1331–40

DIABETOLOGIA

Serum uric acid does not predict CVD mortality

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

- 1 The authors examined whether serum uric acid is associated with cardiovascular disease (CVD) mortality or all-cause mortality in people with T2D.
- 2 Of the participants in the Fremantle Diabetes Study, 1294

- had T2D; of these, 1268 had serum uric acid (SUA) measured at baseline.
- 3 During a mean follow-up of 10.3 years there were 525 deaths; of these, 271 were caused by CVD.
 - 4 Analyses showed that after adjustments for confounding variables, baseline SUA was not an independent predictor of CVD or all-cause mortality, either as a continuous variable or as quartiles.
 - 5 Fasting SUA was not found to be prognostic of CVD in T2D.

Ong G, Davis WA, Davis TME (2010) Serum uric acid does not predict cardiovascular or all-cause mortality in type 2 diabetes: the Fremantle Diabetes Study. *Diabetologia* **53**: 1288–94

DIABETES CARE

Metformin lowers mortality risk in diabetes and HF

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

- 1 Few studies have compared the safety of antidiabetes therapies in people with both T2D and heart failure (HF), although some have suggested better outcomes with metformin treatment.
- 2 The authors examined outcomes in people with T2D and HF to determine whether type of antidiabetes therapy (metformin or other treatment) affected outcome.

- 3 Participants were recruited from the General Practice Research Database: the case group comprised 1633 people with T2D and HF who had died; controls were 1633 people with T2D and HF matched for age, sex, clinic, calendar year and year of follow-up.
- 4 Recruits had both T2D and HF for a mean of 2.8 years.
- 5 In unadjusted analyses, when compared with those controlled without drug treatment, people on sulphonylurea monotherapy, metformin monotherapy or combination therapy had a lower risk of mortality.
- 6 The authors found that current use of metformin therapy was associated with lower mortality risk.

MacDonald MR, Eurich DT, Majumdar SR et al (2010) Treatment of type 2 diabetes and outcomes in patients with heart failure. *Diabetes Care* **33**: 1213–8

DIABETES CARE

Sulphonylurea type does not affect mortality risk in T2D

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

- 1 The objective of this study was to determine whether different types of sulphonylurea would affect the risk of overall mortality in people with T2D.
- 2 An electronic health record system identified 11 141 adults with T2D; at

- baseline, 4279 were on glyburide (GB) monotherapy, 4325 were on glipizide (GZ) monotherapy and 2537 were on glimepiride (GM) monotherapy.
- 3 During follow-up there were 1921 deaths, but there was no statistical difference in overall mortality risk between the different sulphonylureas.
 - 4 In those with documented coronary artery disease (CAD), there was a slight increase in mortality risk with both GB and GZ versus GM, suggesting GM may be a better treatment choice for people with underlying CAD.
- Pantalone KM, Kattan MW, Yu C et al (2010) The risk of overall mortality in patients with type 2 diabetes receiving glipizide, glyburide or glimepiride monotherapy. *Diabetes Care* **33**: 1224–9