Increasing physical activity – an uphill struggle

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The mantras are well-rehearsed and often repeated. Lifestyle is critically important in the prevention and successful management of diabetes. Diet and exercise are key! We try, quite appropriately, to reduce the number of messages and make them simple, easy to understand, easy to implement, and positive (any change in the right direction is worthwhile). The reality is, however, that changing behaviour isn't easy. We know this from personal as well as clinical experience – achieving and sustaining behaviour change is tough and resource intensive. The Finnish and US Diabetes Prevention Programmes (Tuomilehto et al, 2001; Knowler et al, 2002) suggested that programmes designed and facilitated by experts increased efficacy of the intervention and delivered benefits, but how easy is that to implement in routine practice?

This well-conducted trial (Kinmonth et al; summarised alongside) assessed the efficac of a theory-based behavioural intervention to increase physical activity in adults with a parental history of type 2 diabetes. Change in physical activity was measured either by questionnaire or by heart rate monitoring. The two active intervention arms involved a facilitated behaviour change programme – either delivered in the person's own home by a trained facilitator, or by regular telephone contacts. The comparator was an advice leaflet. The facilitated programme was expertly designed and incorporated all the features likely to deliver success: individually-tailored advice supporting moderate intensity activity, with goal-setting, self-monitoring and ongoing support. After 12 months there were no between-group differences in physical activity. A small increase in physical activity over baseline was seen in all three groups – equivalent to walking briskly for 20 minutes more each day. The absence of a group effect of physical activity was not due to failure to deliver the programme as uptake was generally good. The authors did record small to moderate effects of the intervention for improvement in self-reported health status and reduction of anxiety – perhaps just the effect of being in a randomised controlled trial and assigned to active intervention which included regular contact and encouraging support. These benefits should not be discounted, may be significant, and certainly need further study.

One of the paradoxes here is that another publication entitled *Clinic-based support to help overweight patients with type 2 diabetes increase physical activity and lose weight* (Christian et al, 2008), published at roughly the same time as Kinmonth et al's paper, reported a 26% increase in physical activity over baseline with a computer generated assessment of motivational readiness to increase physical activity and make dietary changes – coupled with brief, focused motivational-interview training for physicians.

Kinmonth et al conclude – this stuff is difficult to do and we don't know how to do it best but 'health-care providers should remain cautious about commissioning programmes into individual preventive health-care services'. They also suggest that new routes for individual interventions based on self-monitoring of behaviour after advice offer promise and may be cheaper than more intensive behavioural interventions.

Christian JG, Bessesen DH, Byers TE et al (2008) Clinic-based support to help overweight patients with type 2 diabetes increase physical activity and lose weight. *Archives of Internal Medicine* **168**: 141–6

Knowler WC, Barrett-Connor E, Fowler SE et al (2002) Reduction in the incidence of type 2 diabetes with lifestyle intervention or metformin. *NEJM* **346**:393–403

Tuomilehto J, Lindström J, Eriksson JG et al (2001) Prevention of type 2 diabetes mellitus by changes in lifestyle among subjects with impaired glucose tolerance. *NEJM* **344**:1343–50

LANCET

Behavioural intervention did not improve activity level

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

1 The authors of this study assessed whether a 1-year behavioural intervention based on theory and evidence would increase physical activity in 365 sedentary adults with a parental history of type 2 diabetes.

2 The adults received a behaviour-change programme delivered in their homes or by telephone, or received no intervention: all participants received an advice leaflet. After 1 year, physical activity was objectively measured.

3 Of the 365 individuals enrolled in the study, 1-year data were analysed for 321 of them.

4 The mean difference in physical-activity ratio was -0.04 (95% CI -0.16 to 0.08). The physical-activity ratio did not differ between participants who were delivered the intervention face-to-face or by telephone (mean difference –0.05; 95% CI –0.19 to 0.10).

5 The results of the data analysis indicated that the physical activity ratio did not differ between intervention groups, or with those who only received the advice leaflet.

6 Behavioural intervention was not sufficient to increase physical activity in this at-risk group; preventive health care systems are needed to reverse the trend towards sedentary living.

7 The authors recommend that those commissioning preventative health care services remain cautious.

Kinmonth A-L, Wareham NJ, Hardeman W et al (2008) Efficacy of a theory-based behavioural intervention to increase physical activity in an at-risk group in primary care. *Lancet* **371**: 41–8

CURRENT MEDICAL RESEARCH AND OPINION

Exenatide therapy for ≥3 years shows sustained benefits

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

1 The study determined the effects of exenatide, an incretin mimetic, on glycaemic control, weight loss, CV risk factors and hepatic biomarkers in people with type 2 diabetes who had been treated for ≥3 years.

2 Participants from three placebo-controlled trials were randomised to twice-daily placebo or exenatide (5µg or 10µg) for 30 weeks, followed by exenatide 10µg twice-daily for ≥3 years; 217 people completed 3 years of exenatide treatment.

3 After 3 years, participants had sustained reduced HbA_{1c} (46% achieved HbA_{1c} ≤7%), progressively reduced body weight (84% of participants lost weight) and reduced alanine aminotransferase (ALT; 41% achieved normal ALT).

4 Exenatide treatment for at least 3 years resulted in sustained improvements in glycaemic control, CV risk factors, hepatic injury biomarkers and progressive weight reduction.

Klonoff DC, Buse JB, Nielsen LL et al (2008) Exenatide effects on diabetes, obesity, cardiovascular risk factors and hepatic biomarkers in patients with type 2 diabetes treated for at least 3 years. *Current Medical Research and Opinion* **24**: 275–86

DIABETOLOGIA

Insulin sensitivity improves with excess weight reduction

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

1 The study investigated whether a 50% excess weight reduction (EWR) through a very low-energy diet (VLED) would affect glucose metabolism and insulin sensitivity in 10 obese people with type 2 diabetes who had been treated with insulin.

2 A hyperinsulinaemic-euglycaemic clamp with stable [6,6-$^2H_2$]glucose and [$^2H_5$]glycerol isotopes and skeletal muscle biopsies were performed on day 2 of a VLED and after 50% EWR. No glucose-lowering agents (oral or insulin) were used during the study.

3 A long-term VLED resulting in a 50% EWR normalised basal endogenous glucose production and improved insulin sensitivity, especially insulin-stimulated glucose disposal.

4 Improved insulin signal transduction was observed in skeletal muscle, with a decrease in intramyocellular lipid content.

5 Results confirm the importance of weight reduction in obese people with type 2 diabetes.

Jazet IM, Schaart G, Gastaldelli A et al (2008) Loss of 50% of excess weight using a very low-energy diet improves insulin-stimulated glucose disposal and skeletal muscle insulin signalling in obese insulin-treated type 2 diabetic patients. *Diabetologia* **51**: 309–19

DIABETES CARE

ESRD rate increased in type 2 diabetes

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

1 The study aim was to look at the epidemiology and long-term outcome for people with incident end-stage renal disease (ESRD) and type 1 diabetes (n=1284), type 2 diabetes (n=8560) and without diabetes (n=18704) from a population in Australia and New Zealand.

2 The incident rate of ESRD in people with type 2 diabetes markedly increased over time (+10.2% per year).

3 The renal transplantation rate was 41.8% for type 1 diabetes, 6.5% for type 2 diabetes and 40.9% for without diabetes; however, those with type 1 diabetes had a poor prognosis.

4 Outcome was worse for older women with type 2 diabetes than for older men with type 2 diabetes.

Villar E, Chang SH, McDonald SP et al (2007) Incidences, treatments, outcomes and sex effect on survival in patients with end-stage renal disease by diabetes status in Australia and New Zealand (1991–2005). *Diabetes Care* **30**: 3070–6

DIABETIC MEDICINE

Atorvastatin reduces stroke risk

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

1 The study examined the predictors of stroke and the effect of atorvastatin on stroke subtypes in people with type 2 diabetes.

2 The Collaborative Atorvastatin Diabetes Study (CARDS) comprised 2838 people with type 2 diabetes, and a mean low-density lipoprotein (LDL) cholesterol <4.14 mmol/l and no history of macrovascular disease who were randomised to atorvastatin 10 mg/day or placebo.

3 Patients were assessed monthly for 3 months, then at 6 months and then every 6 months for a median follow up of 3.9 years. An independent endpoint committee reviewed all cerebrovascular events.

4 The effects of atorvastatin on stroke rate and risk of stroke associated with baseline risk factors were estimated using Cox regression analysis.

5 Out of 60 first strokes, 47 were determined as non-haemorrhagic and 13 as indeterminate; atorvastatin treatment was associated with a significant 48% reduction in the rate of all strokes and a significant 50% reduction in the rate of non-haemorrhagic strokes (P=0.024).

6 Independent risk factors predicting stroke were older age, albuminuria and poor glycaemic control; LDL cholesterol was not an important predictor of stroke.

7 Although risk factors specific to diabetes are important predictors of stroke, atorvastatin 10 mg/day safely reduced stroke risk in people with type 2 diabetes.

Hitman GA, Colhoun H, Newman C et al (2008) Stroke prediction and stroke prevention with atorvastatin in the Collaborative Atorvastatin Diabetes Study (CARDS). *Diabetic Medicine* **24**: 1313–21

'Although risk factors specific to diabetes are important predictors of stroke, atorvastatin 10 mg/day safely reduced stroke risk in people with type 2 diabetes.'