Management & prevention of type 2 diabetes

The effect of enhanced care for South Asians

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People from South Asia living in the UK have a higher prevalence of type 2 diabetes than Caucasian populations, and care for this group is often suboptimal.

This study was designed to test the hypothesis that enhanced care for diabetes, tailored to the needs of the South Asian community with type 2 diabetes, would improve risk factors for diabetic vascular complications and ultimately reduce morbidity and mortality.

Six GP practices were randomised to either enhanced care using Asian link workers and extra community diabetes specialist nurses (DSNs) sessions, or standard care. In total 361 patients were randomised: 180 to intervention and 181 to control. Analysis was performed after 1 year on 165 intervention patients and 160 control patients.

There was a significant reduction in systolic (4.6 mmHg) and diastolic (3.4 mmHg) pressures between the two groups (although when corrected for baseline data and age only the change in diastolic pressure remained significant, the systolic being on the borderline of significance), and a reduction of total cholesterol by 0.4 mmol/l. There was no significant change in HbA_{1c} in the trial and no difference between the groups.

The combination of enhanced practice nurse time and education, structured protocols and the use of link workers and community-based DSNs appears to have encouraged and facilitated active participation and concordance of the patients with over 90 % follow-up. Retention of patients was far higher than predicted.

The statistically significant reductions in blood pressure were small, but could be clinically valuable. The cholesterol change was small, but statin prescribing increased in the intervention group, with over 50 % either starting or increasing their dose of statin.

Implementing the UKPDS has been estimated to cost £264 per patient; in this published study in the UKADS the staff costs were £365 per patient per year.

This intensive intervention facilitated participation and over 1 year produced small drops in blood pressure and cholesterol. The authors conclude that better glycaemic control may require longer and possibly different strategies.

DIABETIC MEDICINE

Aspirin use in type 2 diabetes patients

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

1 Cull et al examined data from the UKPDS annual review from 1996/1997 (n=3190) and 2000/01 (n=2467) to ascertain the level of aspirin use in patients with type 2 diabetes before and after the publication of the American Diabetes Association's *Clinical Practice Recommendations* (1997) and the *Joint British Recommendations on the Prevention of Coronary Disease in Clinical Practice* (1998).

2 The analysis found that those taking aspirin were typically male, older and white Caucasian or Indian-Asian (rather than Afro-Caribbean).

3 Between the two analysis points aspirin use rose from 17 % to 31 % ($P<0.0001$) in those with no pre-existing cardiovascular disease (CVD) and from 76 % to 82 % ($P=0.032$) in those with pre-existing CVD. Overall use rose from 22 % to 36 % ($P<0.0001$).

4 In those with no pre-existing CVD, aspirin use approximately doubled from 1996/97 to 2000/01, and less than two-thirds were being treated to the guidelines. Perhaps more trial data need to be published before clinicians are convinced of aspirin therapy in type 2 diabetes.

Cull CA, Neil HAW, Holman RR (2004) Changing aspirin use in patients with type 2 diabetes in the UKPDS. *Diabetic Medicine* **21**: 1368–71

DIABETIC MEDICINE

South Asians in UK could benefit from enhanced care

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

1 Compared to the white Caucasian population, South Asian patients have a much higher incidence of type 2 diabetes (up to four times higher) with earlier onset (up to 10 years), and a higher risk of complications (such as cardiovascular and renal). There is also a 40 % higher mortality rate in the UK South Asian compared to the white Caucasian population.

2 Therefore, the United Kingdom Asian Diabetes Study (UKADS) assessed the delivery of enhanced care to UK South Asians, which inluded Asian link workers and extra community diabetes specialist nurse sessions (intervention group), compared to a control group, for whom care carried on as before.

3 A total of 361 patients from six primary care centres were included in the study The average age was 58.9 and the average time with diabetes 6.5 years (range 3–11 years). Ninety per cent of people from the two groups were followed up 1 year later.

4 Once adjusted for baseline data, age and intervention status only a reduction in diastolic blood pressure remained clinically significant. Systolic blood pressure reduction remained on the borderline of significance and there was no change in HbA_{1c} levels between the two study groups.

5 The study concluded that more work needs to be carried out in order to fully evaluate the needs of ethnic groups with diabetes in the UK.

O'Hare JP, Raymond NT, Mughal S et al (2004) Evaluation of delivery of enhanced diabetes care to patients of South Asian ethnicity: The United Kingdom Asian Diabetes Study (UKADS). *Diabetic Medicine* **21**: 1357–65

'No change was seen in mortality or morbidity rates with α-glucosidase inhibitors, although they do affect postload glucose and insulin.'

DIABETES CARE

AGI therapy in type 2

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

1 This study was a meta-analysis designed to look at the effect of α-glucosidase inhibitors (AGIs) in patients with type 2 diabetes and analyse their mortality, morbidity, glycaemic control, insulin levels, plasma lipids and body weight.

2 A total of 41 studies were included in the analysis (made up of acarbose, miglitol, voglibose and all three combined). The investigators found that AGIs benefited glycohaemoglobin, fasting glucose and postload glucose and insulin, and acarbose decreased BMI.

3 In conclusion no change was seen in mortality or morbidity rates with AGIs, although they do affect postload glucose and insulin concentrations. No effects were seen on blood lipid levels.

van de Laar FA, Lucassen PL, Akkermans RP et al (2005) α-Glucosidase inhibitors for patients with type 2 diabetes. *Diabetes Care* **28**(1): 154–63

DIABETES CARE

Mono- and combined therapies with pioglitazone

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

1 In this study pioglitazone, metformin and gliclazide were administered in combination or alone to patients with type 2 diabetes in order to evaluate the effect on HbA_{1c} and fasting plasma glucose.

2 The results show that pioglitazone used in combination with the other drugs has a beneficial effect on postload glycaemia and composite insulin sensitivity index (CISI).

3 The investigators conclude that pioglitazone is better as monotherapy and in combination at improving postload glycaemia and CISI.

Ceriello A, Johns D, Widel M et al (2005) Comparison of effect of pioglitazone with metformin or sulfonylurea (monotherapy and combination therapy) on postload glycaemia and composite insulin sensitivity index during an oral glucose tolerance test in patients with type 2 diabetes. *Diabetes Care* **28**(2): 266–72

DIABETES CARE

Incidence of diabetes: A review of causes

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

1 This investigation reviewed evidence available for the delay or prevention of type 2 diabetes by drug therapy in MEDLINE, EMBASE, the Cochrane Controlled Trials Registry and reference lists.

2 Agents which have an effect on the incidence of type 2 diabetes were identified (oral hypoglycaemic agents, antiobesity agents, antihypertensive agents, statins, fibrates and oestrogen) and relevant trials and cohort studies which showed an effect were searched.

3 Of the 25 studies found suitable for inclusion, 10 were of oral hypoglycaemic agents and 15 were of non-oral hypoglycaemic agents. Most had the incidence of diabetes as their primary endpoint. A failing of this type of study (including this one) is that secondary and tertiary endpoints cannot be searched for electronically; rather they have to be done manually as some were for this study. No studies could be identified which had any agents other than hypoglycaemic ones.

4 In conclusion a number of studies have shown the effect of different agents on the incidence of diabetes, although only hypoglycaemic agents have been shown to significantly reduce diabetes incidence compared with a placebo. The data for the other agents mentioned above are not conclusive. However it must be noted that no single agent could or should be recommended for diabetes prevention. Therefore it is vital that future studies concentrate more on the onset of diabetes.

Padwal R, Majumdar SR, Johnson JA et al (2005) A systematic review of drug therapy to delay or prevent type 2 diabetes. *Diabetes Care* **28**(3): 736–44

DIABETES CARE

Initiating insulin in type 2 diabetes

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

1 This investigation was done for the INITIATE study group in order to determine the safety and efficacy of once-daily insulin glargine compared with biphasic insulin aspart 70/30 (BIAsp 70/30) taken before breakfast and supper. The study comprised 209 participants.

2 Within the BIAsp 70/30 group (compared with those on once-daily glargine): the results showed significant lowering of HbA_{1c} levels; more patients reached their HbA_{1c} targets; episodes of minor hypoglycaemia were greater (episodes/year); and the dose of insulin and weight gain were greater by the end of the 28-week study.

3 For those participants who had higher basal HbA_{1c} levels (>8.5 %) treatment with BIAsp 70/30 was significantly better and clinically more relevant than once-daily glargine at achieving target HbA_{1c} levels set by the American Diabetes Association(<7 %). Previous studies have shown similar results with biphasic insulin lispro 75/25.

4 The investigators concluded that BIAsp 70/30 is a good alternative for type 2 patients in whom oral antidiabetic therapy has not normalised HbA_{1c} levels, especially for those patients whose HbA_{1c} before insulin initiation was >8.5 %.

Raskin P, Allen E, Hollander P et al (2005) Initiating insulin therapy in type 2 diabetes. *Diabetes Care* **28**(2): 260–5

'No single agent could or should be recommended for diabetes prevention.'

'[This study] clearly indicates dipeptidyl peptidase-IV as a possible target for the reduction of HbA_{1c} levels.'

DIABETES CARE

Effect of a DPP-IV inhibitor in metformin-treated patients

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

1 Patients who are continuing metformin treatment were recruited to this study in order to evaluate the effect of LAF237 (a dipeptidyl peptidase IV [DPP-IV] inhibitor) with respect to HbA_{1c} and fasting plasma glucose (FPG) levels over a 12- or 52-week period. Baseline results were calculated at weeks 12 and 52 using standardised meals.

2 HbA_{1c} levels were significantly decreased with LAF237 at week 12 compared with those who received a placebo. Although those patients taken through to 52 weeks showed no extra reduction, those on placebo showed a significant increase. FPG and average prandial glucose levels were significantly reduced in patients receiving LAF237 compared with those on placebo. No significant change was observed in mean plasma glucose levels.

3 In conclusion, treatment with LAF237 once daily for 1 year presented with clear, significant and clinically relevant lower levels of HbA_{1c} in metformin-treated patients with type 2 diabetes.

4 This short study opens the way for larger studies of LAF237 to test its efficacy and safety in a more meaningful population. It clearly indicates DPP-IV as a possible target for the reduction of HbA_{1c} levels.

Ahrén B, Gomis R, Standl E et al (2004) Twelve- and 52-week efficacy of the dipeptidyl peptidase IV inhibitor LAF237 in metformin-treated patients with type 2 diabetes. *Diabetes Care* **27**(12): 2874–80

DIABETES CARE

Pharmacy claims-based measures to influence adherence

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

1 The aim of this study was to evaluate pharmacy claims-based medication adherence as a tool to assess whether adherence is associated with clinical outcomes for type 2 diabetes patients.

2 The study consisted of 677 randomly chosen patients older than 18 years with diagnosed diabetes, hypercholesterolaemia and hypertension. The participants also had to have taken out at least one prescription for an antidiabetic, antihypertensive or lipid-lowering drug in 1999, 2000 and 2001. The study endpoints were HbA_{1c} levels, LDL-cholesterol levels and blood pressure.

3 As may be expected, non-adherence was associated with a general worsening of diabetes management: although blood pressure did not show a significant change with nonadherence to ACE inhibitors, non-adherence to metformins and statins was significantly linked with an increase in HbA_{1c} and LDL-cholesterol levels.

4 Claims-based measures are strongly associated with clinical outcomes of chronic medical conditions. The investigators concluded that such measures would be extremely useful in the primary care of conditions such as diabetes. Therefore, more research is needed to enable introduction of claims-based measures into primary/clinical care where it will benefit the patient through better education about the possible outcomes of non-adherence.

Pladevall M, Williams LK, Potts LA et al (2004) Clinical outcomes and adherence to medications measured by claims data in patients with diabetes. *Diabetes Care* **27**(12): 2800–5

'Claims-based measures are strongly associated with clinical outcomes of chronic medical conditions.'

DIABETES CARE

Pharmacists can improve care in diabetes

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

1 This short report outlines how pharmacists in an Arizona-based primary care centre, whose population is composed of mainly impoverished Spanish-speaking people, have affected the disease management of those with type 2 diabetes.

2 The centre where the study was carried out is a government-approved and -run centre. The programme was begun in August 2001. The pharmacists acted as the primary care provider for the patients' type 2 diabetes, comorbidities, hypertension and hyperlipidaemia.

3 The pharmacists provided diagnostic, educational and therapeutic management services in line with the staff-approved collaborative practice agreement.

4 A total of 199 patients were included in the study, of whom 64 % were female, 74 % were Hispanic and 92 % had type 2 diabetes. The participants were followed for an average of 274 (±141) days during which measurements were taken for cholesterol (HDLc, LDLc and triglycerides [TG]), blood glucose levels, HbA_{1c}, blood pressure, body weight and body mass index.

5 Of all the measurements taken, those that significantly changed favourably were total cholesterol, TG, LDLc, blood glucose, HbA_{1c} and blood pressure (diastolic and systolic).

6 In conclusion, a pharmacist-based care management system for type 2 diabetes works in a well-managed centre which has agreed on a standard of care for their patients.

Leal S, Glover JJ, Herrier RN, Felix A (2004) Improving quality of care in diabetes through a comprehensive pharmacist-based disease management system. *Diabetes Care* **27**(12): 2983–4

'This study shows that there is a major discrepancy between risk factors for diabetes being diagnosed and actual treatment regimens being implemented.'

DIABETES CARE

New measures of clinical care needed

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

1 The aim of this study was to evaluate the quality of care received by diabetes patients through USA academic medical centres.

2 A total of 1765 patients were put forward, by 44 clinics from 30 different academic medical centres, for this retrospective analysis. Eligibility for inclusion into the study included diagnosed type 1 or 2 diabetes and ≥18 years old, and patients must have visited the clinic at least twice in the 24 months prior to 10 January 2001, with the most recent visit occurring in the 6 months before this date.

3 Patients whose risk factors (HbA_{1c} and cholesterol levels from last visit to clinicians and blood pressure from visit of investigators) were raised between their last two visits had their medical regimens analysed to evaluate if they had had a change due to their elevated risk.

4 Of the total study population 85.4 % had type 2 diabetes, of whom 34.0 % were at their target HbA_{1c} levels, an average of 34.3 % were at their target blood pressure levels, and an average of 49.4 % were at their target LDL-cholesterol levels.

5 Of the medical centres, those that were diabetes/endocrinology specialist centres (compared with general medicine centres) had significantly higher rates of patients at target levels for the risk indications tested for.

6 As the HbA_{1c} levels rose above specified targets, more patients either were initiated on insulin or had their existing medical management regimens changed at the last visit to the clinician. However, too high a number of patients remained on unsuitable or no treatment plans.

7 This study shows that there is a major discrepancy between risk factors for diabetes being diagnosed and actual treatment regimens being implemented, indicating that perhaps new measures of clinical care are needed for chronic conditions such as diabetes.

Grant RW, Buse JB, Meigs JB (2005) Quality of diabetes care in US academic medical centres. *Diabetes Care* **28**(2): 337–42

'Metformin treatment improves endothelial function independent of HbA_{1c} levels, but does not affect low-grade inflammation.'

JOURNAL OF INTERNAL MEDICINE

Metformin and endothelial function

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

1 The investigators hypothesised that metformin improves endothelial function, thereby decreasing cardiovascular morbidity and mortality independent of glycaemic levels. Data on how metformin affects endothelial function and low-grade inflammation are scarce.

2 The article presents an interim analysis at 16 weeks and included 353 participants (171 on metformin, 182 on placebo) who completed the course. This trial (Hyperinsulinaemia: the Outcome of its Metabolic Effects [HOME]) is intended to end at 4 years.

3 Markers of endothelial function (such as urinary albumin excretion and soluble vascular cell adhesion molecule-1) all significantly improved in metformin- versus placebo-treated patients (all on intensive insulin therapy).

4 In conclusion, metformin treatment improves endothelial function independent of HbA_{1c} levels, but does not affect low-grade inflammation. This goes toward explaining how metformin is associated with a reduction in cardiovascular events.

De Jager J, Kooy A, Lehert PH et al (2005) Effects of short-term treatment with metformin on markers of endothelial function and inflammatory activity in type 2 diabetes mellitus: A randomized, placebo-controlled trial. *Journal of Internal Medicine* **257**: 100–9

DIABETES CARE

Once-daily basal vs twice-daily premixed insulins

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

1 This study focused on patients for whom oral antidiabetic agents (OADs) have been unsuccessful in aiding the management of type 2 diabetes. It aimed to evaluate the safety and efficacy of increasing once-daily basal insulin compared with a new treatment of twice-daily premixed insulin.

2 The study included 371 insulin-naïve patients with poor self-managed blood glucose levels on OADs. The participants were randomised to once-daily glargine and OAD or to biphasic human NPH insulin 70/30.

3 Glargine plus OAD led to a significantly better improvement compared with biphasic human NPH insulin 70/30 with respect to HbA_{1c} levels (higher proportion reached targets and lowered levels from baseline), fasting blood glucose decrease was also greater with glargine plus OAD.

4 Glargine plus OAD patients also had significantly reduced night-time hypoglycaemic attacks; this is interesting as a fear of hypoglycaemic episodes remains a big obstacle to initiating or optimising insulin therapies.

5 In conclusion, this study demonstrated that rather than initiating a new treatment regimen, if an individual with type 2 diabetes on once-daily OAD (metformin plus sulphonylurea) is poorly managing his/her blood glucose levels, adding a simple extra injection of insulin glargine to reduce risk indicators works significantly better.

Janka HU, Plewe G, Riddle MC et al (2005) Comparison of basal insulin added to oral agents versus twice-daily premixed insulin as initial insulin therapy for type 2 diabetes. *Diabetes Care* **28**(2): 254–9