Cardiovascular journals

DIABETES RESEARCH & CLINICAL PRACTICE

Potential 48% reduction in cardiovascular hospitalisations

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

1 This study surveyed adults with diabetes in Brazil to assess whether hospitalisations due to cardiovascular (CV) complications of diabetes can be reduced by a greater use of interventions in primary care.

2 The survey was conducted from July 2006 to September 2007 in Porto Alegre and 2590 adults (>25 years of age) were interviewed.

3 The study estimated the prevalence of interventions use (such as, metformin, hypertension control, angiotensin-converting enzyme inhibitors, statins, influenza vaccination and cardioprotective diet) and hospitalisation rate.

4 The absolute risk reduction for each intervention was calculated by applying relative risk reductions from those published in the literature to the baseline CV hospitalisation rate.

5 The disease impact number (DIN) was modelled on the number of people with diabetes needing primary healthcare coverage to prevent one hospitalisation.

6 For every 100 participants there were 30 CV hospitalisations over the 5-year study period. If more interventions were used in primary care, CV hospitalisations could potentially be reduced by 48%.

7 The authors concluded that the use of effective CV interventions needs to be optimised to maximise their benefit in terms of reducing hospitalisations.

Luft VC, Giugliani C, Harzheim E et al (2009) Prevalence of use and potential impact of increased use of primary care interventions to prevent cardiovascular hospitalizations in patients with diabetes. *Diabetes Res Clin Pract* **85**: 328–34

Can improvements in primary care reduce diabetes-related hospitalisations?

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

In this harsher economic climate, it is imperative that we make all attempts to realise the full potential of existing evidence-based strategies to reduce diabetes complications and hospitalisations. This is clearly what people desire and can result in real cost savings. There is an increasing pool of evidence that shows that one in seven of all inpatients have diabetes (Rayman, 2009). These individuals often have a greater length of stay and are originally hospitalised due to preventable complications.

The study by Luft et al (2009; summarised alongside) starts by reviewing the literature to make a list of the main evidence-based interventions that are proven to reduce CVD hospitalisation. This includes metformin use, hypertension management, angiotensin-converting enzyme inhibitor use, statins, influenza vaccination, aspirin, cardio-protective diet, regular physical activity and smoking cessation.

In the elegant analysis presented, the proportion targeted for each intervention in the population had the proportion already having that intervention subtracted, to define a measure of the "shortfall" in treatment. This resulted in a "disease impact number", which suggested the number of people that need to be treated to save one hospitalisation. This ranged from 36 for intensified hypertension control to 428 for regular physical exercise. In summary, it was deemed that at least 48% of hospitalisations could be prevented by achieving realistic targets for each of the interventions.

In the UK, we could argue that we are doing this anyway with the Quality and Outcomes Framework. But are we? I suspect that the Pareto Principle applies to diabetes hospitalisations as well: that 80% of admissions come from 20% of the worst managed people, for a range of reasons, including treatment adherence and health service delivery. The analysis by Luft et al provides an analytical framework to calculate our current "efficiencies" and potential for reducing hospitalisations.

Rayman G (2009) *Preparing for the National Inpatient Diabetes Audit. Answers to your questions.* NHS Diabetes, Leicester

DIABETES CARE

Combined blood pressure and glucose lowering therapy improves outcomes

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

1 This study is an analysis of the results of the ADVANCE (Action in Diabetes and Vascular Disease: Preterax and Diamicron MR Controlled Evaluation) trial evaluating how much benefit intensive glycaemic control and blood pressure-lowering provides with respect to vascular outcomes.

2 ADVANCE compared perindopril-indapamide with placebo and intensive glycaemic control using a gliclazide MR-based regimen with standard glycaemic control in 11 140 participants with T2D for 4.3 years.

3 Annual rates and risk of major macrovascular and microvascular events were considered separately and jointly. Rates of renal events and death were also assessed.

4 Combination treatment resulted in a reduced risk of new or worsening nephropathy by 33% (P=0.005), new onset of macroalbuminuria by 54% (P<0.0001), and new onset of microalbuminuria by 26% (P<0.001).

5 Routine blood pressure lowering and intensive glycaemic control combined produced additional reductions in clinical outcomes.

Zoungas S, de Galan BE, Ninomiya T et al (2009) Combined effects of routine blood pressure lowering and intensive glucose control on macrovascular and microvascular outcomes in patients with type 2 diabetes: New results from the ADVANCE trial. *Diabetes Care* **32**: 2068–74

"There is a high prevalence of cardiovascular disease risk factors in people with type 1 diabetes and end-stage renal disease and their control is still insufficient, despite improvements in control over the years."

DIABETES CARE

CV risk factors predict neuropathy

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

1 The objective of this statistical analysis was to establish modifiable risk factors for large nerve fibre dysfunction measured by vibration perception threshold (VPT).

2 Participants were 1407 people with type 1 diabetes. VPT was measured using biothesiometry on the medial malleolus and right big toe. A result was classed as abnormal if it was >2 standard deviations from the predicted mean for the individuals age.

3 Increased incidence of gangrene, amputation, foot ulceration, leg bypass or angioplasty and mortality were associated with abnormal VPT ($P \leq 0.02$)

4 Hypertension ($P<0.0001$), total cholesterol ($P=0.002$), and weight ($P<0.0001$) among other cardiovascular disease risk factors, were all significant risk factors for large nerve fibre dysfunction.

Elliott J, Tesfaye S, Chaturvedi N et al (2009) Large-fiber dysfunction in diabetic peripheral neuropathy is predicted by cardiovascular risk factors. *Diabetes Care* **32**: 1896–900

JOURNAL OF DIABETES & ITS COMPLICATIONS

Improvement in cardiovascular disease risk factors

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

1 The prevalence of cardiovascular disease risk factors (CVDRF) was evaluated in people with type 1 diabetes and end-stage renal disease from 1999–2006.

2 Participants ($n=177$) had a mean diabetes duration of 24.3±5.9 years and a mean HbA_{1c} level of 7.9±1.5% (63 mmol/mol); 29.6% had an HbA_{1c} level of <7% (<53 mmol/mol).

3 Participants had a mean LDL level of 2.83±1.04 mmol/L with 41.1% having an LDL level <100 mg/dL. Over the 7-year observation period the proportion of people with an HbA_{1c} level of <7% (<53 mmol/mol) and an LDL level <2.6 mmol/L increased ($P=0.028$ and $P=0.0015$, respectively).

4 In total, 89.3% of participants had one or more CVDRFs. There was a significant trend towards a reduction in CVDRFs over time ($P=0.005$).

5 The authors concluded that there is a high prevalence of CVDRFs in people with type 1 diabetes and end-stage renal disease and that their control is still insufficient, despite improvements over the years.

Rueda SF, Fernández C, Nicolau J et al (2009) Prevalence of cardiovascular risk factors in patients with type 1 diabetes in end-stage renal disease: changes in the trend from 1999 to 2006. *J Diabetes Complications* **23**: 317–22

DIABETES CARE

High postprandial glucose levels predict CV death

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

1 This observational study looked at whether postprandial glucose levels in metabolic syndrome could be a predictor of cardiovascular (CV) death.

2 A total of 15145 individuals without diabetes or CV disease were observed. Postprandial glucose was obtained 2 hours after lunch.

3 After 6.7 years follow-up, 410 people died, 82 of which from CV causes.

4 After adjustment for metabolic parameters, elevated 2-hour postprandial was found to increase the risk of CV death (hazard ratio, 1.26 [95% confidence interval, 1.11–1.42]).

Lin HJ, Lee BC, Ho YL et al (2009) Postprandial glucose improves the risk prediction of cardiovascular death beyond the metabolic syndrome in the nondiabetic population. *Diabetes Care* **32**: 1721–6

DIABETES CARE

Accuracy of the UKPDS, SCORE and Framingham risk engines

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

1 The validity of three risk functions in predicting risk of coronary heart disease (CHD) was tested in people with normal glucose tolerance (NGT; $n=1125$), intermediate hyperglycaemia ($n=232$) and type 2 diabetes ($n=125$) at baseline.

2 Participants had taken part in the Hoorn study, which was a population-based cohort study that began in 1989 and comprised 2484 Dutch caucasian men and women, aged 50–75 years.

3 Calibration and discrimination were tested in the Framingham, systematic coronary risk evaluation (SCORE) and UK Prospective Diabetes Study (UKPDS) risk functions.

4 After 10 years of follow-up, 197 CHD events were observed, of which 43 were fatal. The group with type 2 diabetes had the highest percentage of first CHD events.

5 The risk of first CHD event was overestimated by the Framingham and UKPDS prediction models for all groups.

6 The best predictor of fatal CHD events was the SCORE risk function in the NGT group (area under the receiver operating characteristic curve 0.79 [95% confidence interval [CI], 0.70–0.87]). The UKPDS estimated fatal CHD risk better in the intermediate hyperglycaemia group (0.84 [95% CI, 0.74–0.94]).

7 The Framingham risk function may overestimate an individual's absolute risk of a CHD event.

Van der Heijden AA, Ortegon MM, Niessen LW et al (2009) Prediction of coronary heart disease risk in a general, pre-diabetic, and diabetic population during 10 years of follow-up: accuracy of the Framingham, SCORE, and UKPDS risk functions: The Hoorn Study. *Diabetes Care* **32**: 2094–8