

## Major journals

BMJ

### QRISK2 algorithm for heart disease risk assessment

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

**1** This study evaluated the efficacy of the updated version of the QRISK algorithm for cardiovascular disease risk assessment. The QRISK2 algorithm was tested people from various ethnic backgrounds in England and Wales, and the results were compared with the NICE-recommended version of the Framingham score.

**2** Using a prospective, open cohort study design, data from 2.3 million individuals from 531 general practices were included in the analysis.

**3** The authors used the QRISK2 algorithm to evaluate details of cardiovascular disease diagnoses, including coronary heart disease and stroke, and risk factors such as age, gender, ethnic background, smoking, systolic blood pressure and cholesterol levels, BMI, family history of heart disease, and diagnosis of diabetes, in order to determine overall cardiovascular risk.

**4** Compared with the Framingham score currently used in practice, QRISK2 showed improved discrimination and calibration.

**5** The QRISK2 algorithm identified a greater percentage of the population at increased risk of heart disease compared with the Framingham score.

**6** The QRISK2 algorithm, with its added assessment of ethnicity and extended clinical background data inclusion, is more accurate in the identification of those at high risk of cardiovascular disease.

Hippisley-Cox J, Coupland C, Vinogradova Y et al (2008) Predicting cardiovascular risk in England and Wales: prospective derivation and validation of QRISK2. *BMJ* **336**: 1475–82

### Predicting CVD risk in England and Wales: Validation of QRISK



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

The paper by Hippisley-Cox and colleagues (summarised alongside) will start a real debate in the UK about the continuing use of the Framingham risk-engine for most of the cardiovascular disease (CVD) risk calculations we undertake, both in clinical practice and to inform major national guidelines, such as those originating from NICE.

Framingham CVD risk assessment has been such a holy cow that we have even rejected the UKPDS (UK Prospective Diabetes Study) risk-engine for use in people with type 2 diabetes. This is despite the UKPDS risk-engine being based on data from around 10 times more individuals with diabetes than the Framingham risk-engine.

The claim that QRISK improves the accuracy of identification of those in the UK population is well substantiated in the paper. However, it has to be stated that the Framingham risk

modelling was similar to QRISK in explaining the variation in CVD risk score. The great advance, if the QRISK score is to be used in clinical practice, would be the heightened awareness of the full panoply of risk factors that affect CVD risk. A particularly important finding is the effect of ethnicity. Important heterogeneities within the South Asian population were revealed, with the Pakistani population having the highest adjusted hazard-ratio for CVD. Crucially, however, QRISK is the first large-scale population-based CVD risk model that incorporates social deprivation as a risk factor based on the Townsend Deprivation score. Other clinically important variables not used in most other risk models include body mass index, diagnosis of hypertension, rheumatoid arthritis, atrial fibrillation and chronic renal disease.

QRISK, now validated, has the potential to identify those at highest risk of CVD in the UK population such that our resources, always limited, can be focused to the greatest benefit. Reducing health inequalities is likely to result from this initiative.

### ARCHIVES OF INTERNAL MEDICINE

#### Coronary artery calcium is a better predictor of CVD than intima-media thickness

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

**1** This US-based study was undertaken to ascertain whether carotid intima-media thickness or coronary artery calcium was better at predicting cardiovascular disease (CVD) events.

**2** A prospective cohort study of 6698 individuals from the Multi-Ethnic Study of Atherosclerosis who had no

previous history of CVD was undertaken.

**3** All individuals were aged between 45 and 84 years, and the main outcome measure was risk of incident CVD in the form of coronary heart disease, stroke or fatal CVD. The maximum follow-up period was 5.4 years.

**4** During the follow-up period (median 3.9 years), 222 incident CVD events occurred.

**5** The authors examined the data for coronary artery disease, and found that, as a predictor of incident CVD events, coronary artery calcium score was superior to carotid intima-media thickness.

Folsom AR, Kronmal RA, Detrano RC et al (2008) Coronary artery calcification compared with carotid intima-media thickness in the prediction of cardiovascular disease incidence: the Multi-Ethnic Study of Atherosclerosis (MESA). *Archives of Internal Medicine* **168**: 1333–9

“There is insubstantial evidence to support the benefit of diabetes screening in the general population.”

## BMJ

### Deaths from coronary heart disease double in people with diabetes

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

1 This population-based study aimed to assess and compare the rate of death from coronary heart disease in

individuals with and without diabetes.

2 Data were analysed from two Norwegian health surveys, one including 74 914 participants and the other 64 829.

3 A total of 2623 men and 1583 women with diabetes died as a result of coronary heart disease, however, mortality was lower in the most recent survey.

4 People with diabetes had more than two-fold number of deaths related to coronary heart disease.

Dale AC, Vatten LJ, Nilsen TI et al (2008) Secular decline in mortality from coronary heart disease in adults with diabetes mellitus: cohort study. *BMJ* **337**: a346

## ANNALS OF INTERNAL MEDICINE

### People with hypertension benefit from early diabetes screening

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

1 Type 2 diabetes affects over 19 million people in the USA, around one-third of whom remain undiagnosed. This study investigated the benefit of mass diabetes screening for the improvement of outcomes in order to provide a US-governmental task-force

update.

2 Data from all studies published between March 2001 and July 2007 investigating the potential benefits or adverse effects of screening for diabetes were included in this qualitative meta-analysis.

3 The authors conclude that there is insubstantial evidence to support the benefit of diabetes screening in the general population. As blood pressure targets for people with diabetes are quite low, it is suggested that knowing that they have diabetes might be more beneficial in the population with hypertension.

Norris SL, Kansagara D, Bougatsos C et al (2008) Screening adults for type 2 diabetes: a review of the evidence for the U.S. Preventive Services Task Force. *Annals of Internal Medicine* **148**: 855–68

## ARCHIVES OF INTERNAL MEDICINE

### Addition of HbA<sub>1c</sub> to Framingham risk score improves assessment in men

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

1 This study explored the effect of adding data on changes in HbA<sub>1c</sub> levels to the list of Framingham score assessment criteria in order to improve

prediction of coronary heart disease.

2 Data from a total of 10 295 people in the UK were analysed using the modified Framingham score, and results were compared with the original score.

3 Risk was calculated as 0.72 for men and 0.80 for women using the original Framingham risk score, compared with 0.73 and 0.80, respectively, using the modified score; the difference between scores was significant only in the male population.

Simmons RK, Sharp S, Boekholdt SM et al (2008) Evaluation of the Framingham risk score in the European Prospective Investigation of Cancer-Norfolk cohort: does adding glycated hemoglobin improve the prediction of coronary heart disease events? *Archives of Internal Medicine* **168**: 1209–16

## ARCHIVES OF INTERNAL MEDICINE

### HbA<sub>1c</sub> is an independent risk factor for CV death in people with diabetes and heart failure

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

1 This study investigated the known association of increased HbA<sub>1c</sub> levels and cardiovascular disease (CVD), and the incidence of symptomatic chronic heart failure in people with and without diabetes.

2 Participants from the CHARM (Candesartan in Heart Failure: Assessment of Reduction in Mortality and Morbidity) programme were included in this analysis; participants had at least one HbA<sub>1c</sub> measurement, and a total of 907 of the 2412 participants had diabetes.

3 Median follow-up was 34 months, and the primary outcomes were CVD-related death or hospitalisation for heart failure.

4 Risk of primary outcomes were increased in individuals with higher HbA<sub>1c</sub> levels ( $P < 0.001$ ); when HbA<sub>1c</sub> level increased by 1% the hazard ratios were 1.24 for CVD-related death, 1.25 for hospitalisation or worsening of heart failure, and 1.22 for heart failure mortality, after adjusting for age and gender.

5 Hazard ratios were similar for all outcomes in individuals with and without diabetes, indicating that HbA<sub>1c</sub> level is an independent risk factor for cardiovascular-related death, hospitalisation for heart failure and mortality due to heart failure.

Gerstein HC, Swedberg K, Carlsson J et al (2008) The hemoglobin A1c level as a progressive risk factor for cardiovascular death, hospitalization for heart failure, or death in patients with chronic heart failure: an analysis of the Candesartan in Heart Failure: Assessment of Reduction in Mortality and Morbidity (CHARM) program. *Archives of Internal Medicine* **168**: 1699–704

## JOURNAL OF THE AMERICAN COLLEGE OF CARDIOLOGY

### Plasma glucose levels can indicate risk of diabetes, even within accepted range

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

1 “Normal” fasting plasma glucose levels are within a set range; this study investigated the association between increased levels of plasma glucose within the normal accepted range, and increased risk of diabetes.

2 A total of 46 578 people with normal plasma glucose levels, defined as <100 mg/dL, with no previous diagnosis of diabetes, were included in this study.

3 Participants were assigned to one of four groups according to fasting glucose levels: <85, 85–89, 90–94, or 95–99 mg/dL.

4 Follow-up was a mean 81 months, during which time diabetes developed at a rate of 1% per year; risk of diabetes increased by 6% for every 1 mg/dL of plasma glucose increase ( $P<0.001$ ).

5 Diagnosis of diabetes was recorded, and a Cox regression analysis adjusted for age, gender, BMI, and blood pressure was used to determine association with the incidence of diabetes.

6 Those with fasting blood glucose between 90–94mg/dL were found to be 2.33 times more likely to develop diabetes compared with the 85–89 mg/dL group.

7 Thus, increased fasting glucose, even within the normal range, can indicate increased risk of diabetes.

Nichols GA, Hillier TA, Brown JB (2008) Normal fasting plasma glucose and risk of type 2 diabetes diagnosis. *Journal of the American College of Cardiology* **121**: 519–24

## LANCET

### Apolipoproteins most effective for estimating risk of acute myocardial infarction

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

1 This case–control comparison study aimed to clarify whether or not use of apolipoprotein levels is more effective

than cholesterol levels for predicting risk of acute myocardial infarction.

2 Blood samples from a multi-ethnic cohort of 345 cases and 12 120 controls were tested for concentrations of plasma lipids, apolipoprotein levels and cholesterol.

3 The apolipoprotein B100: apolipoprotein A1 ratio had a higher population-attributable risk (54%) compared with that of the LDL-cholesterol:HDL-cholesterol ratio, which was 37%.

McQueen MJ et al (2008) Lipids, lipoproteins, and apolipoproteins as risk markers of myocardial infarction in 52 countries (the INTERHEART study): a case-control study. *Lancet* **372**: 224–33

## BMJ

### Blood pressure indicative of risk of retinopathy in type 1 diabetes

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

1 This study investigated the association between blood pressure, retinopathy and nephropathy in people with type 1 diabetes.

2 A total of 1816 individuals with childhood-onset type 1 diabetes participated in this study; a total of 36%

of participants developed retinopathy, and incidence of retinopathy was associated with higher systolic blood pressure and diastolic blood pressure.

3 In people with low albumin excretion rates, risk of retinopathy was increased in those with systolic or diastolic blood pressure on or above the 90th centile ( $P=0.03$  and  $P=0.005$  for systolic and diastolic, respectively).

4 Thus, changes in both systolic and diastolic blood pressure were shown to predict retinopathy; risk of retinopathy was deemed independent of incidence of nephropathy in adolescents with type 1 diabetes.

Gallego PH, Craig ME, Hing S, Donaghue KC (2008) Role of blood pressure in development of early retinopathy in adolescents with type 1 diabetes: prospective cohort study. *BMJ* **337**: a918

## LANCET

### Nurse intervention improves outcome in those at increased risk of cardiovascular disease

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

1 This study compared the effect of a specialised nurse intervention programme (INT) with usual care (UC) in people with coronary heart disease and in

those at increased risk of cardiovascular disease (CVD); outcomes including lifestyle changes, management of blood pressure, and lipid levels after 1 year were assessed.

2 After 1 year, smoking cessation was observed in 58% of in the INT and 47% of the UC groups; individuals in the INT group showed the greatest improvements in diet, and a larger proportion of people in this group achieved their blood pressure targets.

Wood DA, Kotseva K, Connolly S et al (2008) Nurse-coordinated multidisciplinary, family-based cardiovascular disease prevention programme (EUROACTION) for patients with coronary heart disease and asymptomatic individuals at high risk of cardiovascular disease: a paired, cluster-randomised controlled trial. *Lancet* **371**: 1999–2012

“Increased fasting glucose, even within the normal range, can indicate increased risk of diabetes.”