Primary Prevention of Cardiovascular Disease in Diabetes: Treat as Secondary Prevention or Assess Individual Risks?

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A Problematic Patient with Diabetes

- 52years old men Type 2 DM 4 years. Smoking 10/day. HbA1c 8,7% No retinopathy
- Blood pressure 164/98 mmHg. No chest pain.
- Biochemistry - Urea 6 mmol/l
  - Creatinine 105 Mmol/l
  - Total cholesterol 5,3 mmol/l
  - HDL cholesterol 0,9 mmol/l
  - Tryglycerride 2,6 mmol/l
  - Albumin excretion rate 60mg/24hrs

Questions

- 1. What is his main future risk in terms of complications of diabetes
- 2. Quantify this risk as a figure (% risk over the next 10 year)
- 3. What evidence-based management should you administer?
- 4.How much is it going to cost to prevent 1 event using just one agent?

INTRODUCTION

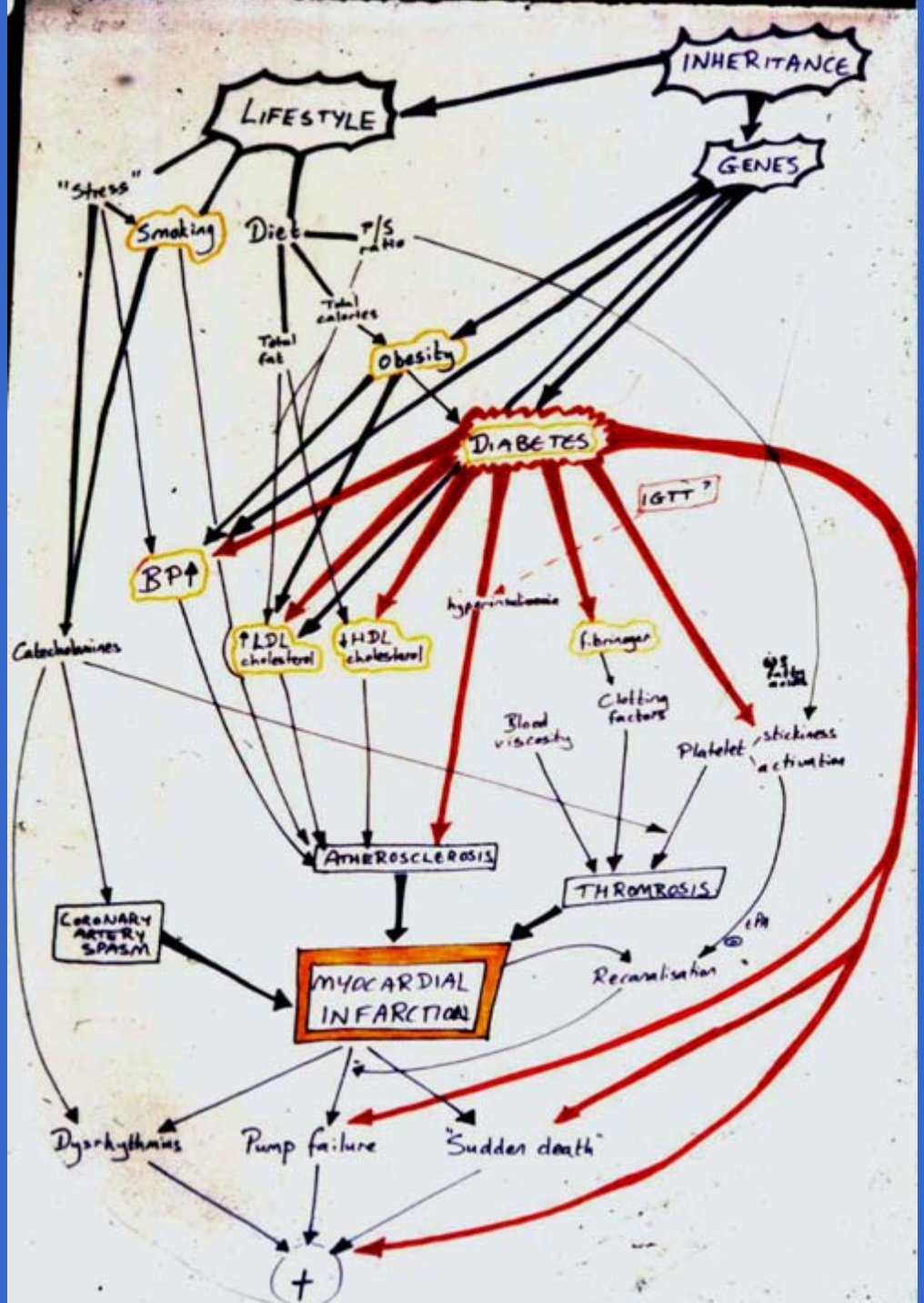
- Diabetes and risk factors for cardiovascular disease
- Treating risk factors in diabetes - glucose, blood pressure and lipids
- Primary prevention and secondary prevention - an evidence base?
- The case of aspirin
- Levels of risk factors versus levels of risk

DIABETIC COMPLICATIONS IN THE UKPDS

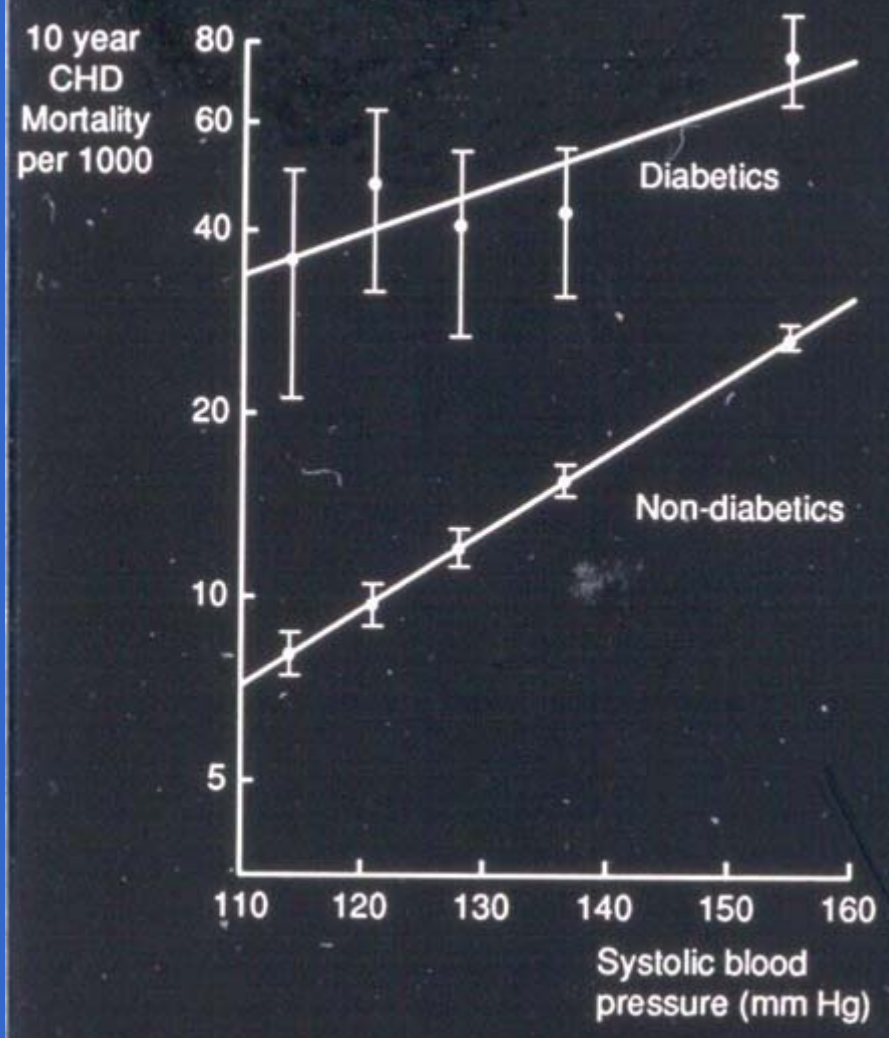
(Type 2 DM, Age 53, BMI 27.5, SBP 135, Chol 5.4)

Any diabetes-related endpoint 46.0/1000 patient years

Macrovascular disease	24.0	
AMI		17.0
Stroke		5.0
Microvascular disease	11.4	
Chronic renal failure		0.8
Photocoagulation		11.0
Blind one eye		3.5

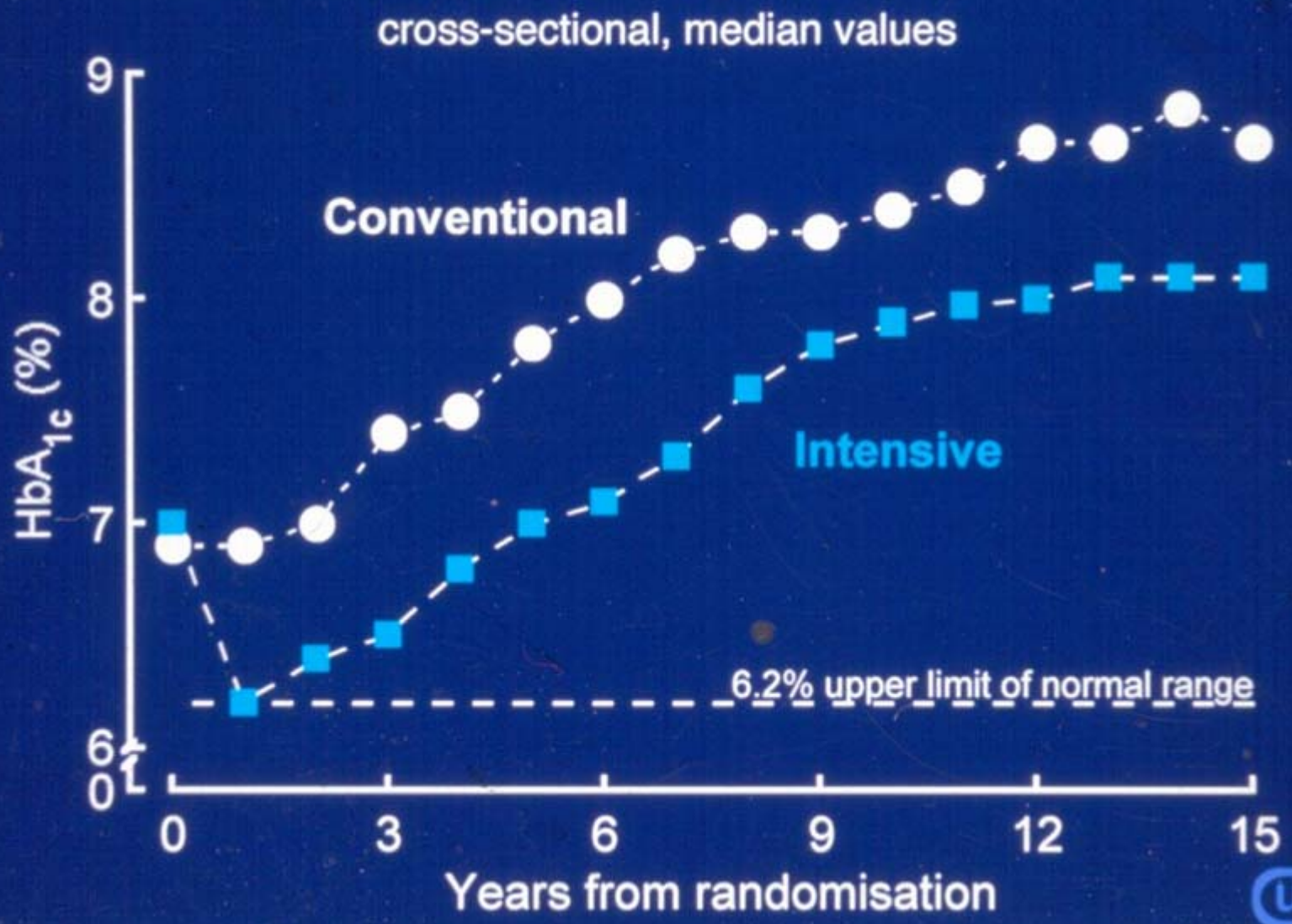

INHERITANCE
LIFESTYLE
GENES
"Stress"
Smoking
Diet
P/S ratio
Total calories
Total fat
Obesity
DIABETES
IGT?
BP↑
↑LDL cholesterol
↓HDL cholesterol
hyperinsulinaemia
fibrinogen
Clotting factors
Blood viscosity
Platelet stickiness activation
Catecholamines
ATHEROSCLEROSIS
THROMBOSIS
CORONARY ARTERY SPASM
MYOCARDIAL INFARCTION
tPA
Recanalisation
Dysrhythmias
Pump failure
"Sudden death"
+

Systolic Blood Pressure and 10 year CHD mortality in 342815 non-diabetic and 5163 diabetic men aged 35-57



Stamler (1991)

HbA_{1c}


cross-sectional, median values
Conventional
Intensive
6.2% upper limit of normal range
HbA1c (%)
9
8
7
6
0
0
3
6
9
12
15
Years from randomisation

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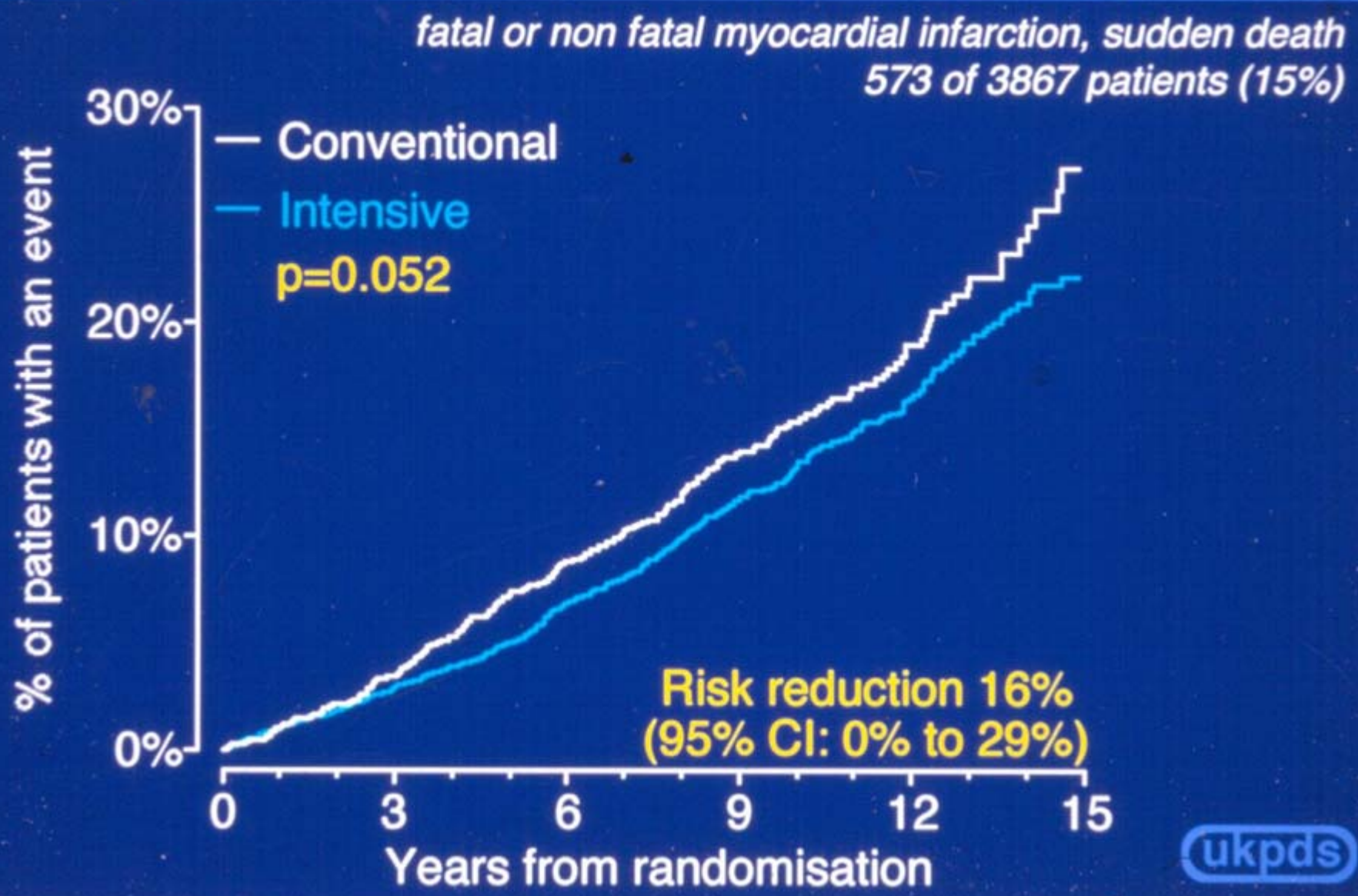
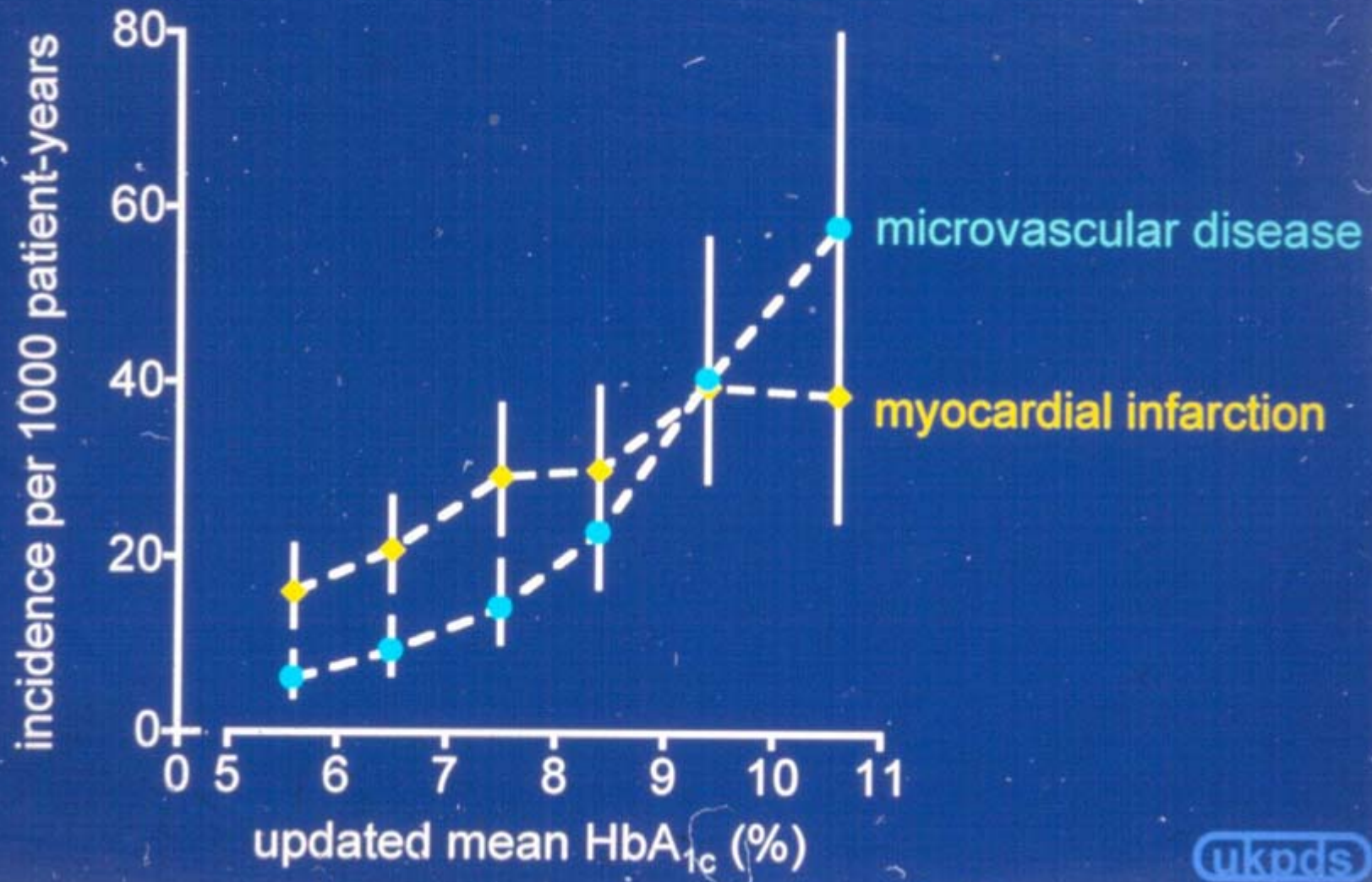
Myocardial Infarction (cumulative)



Epidemiological analysis by HbA_{1c} categories



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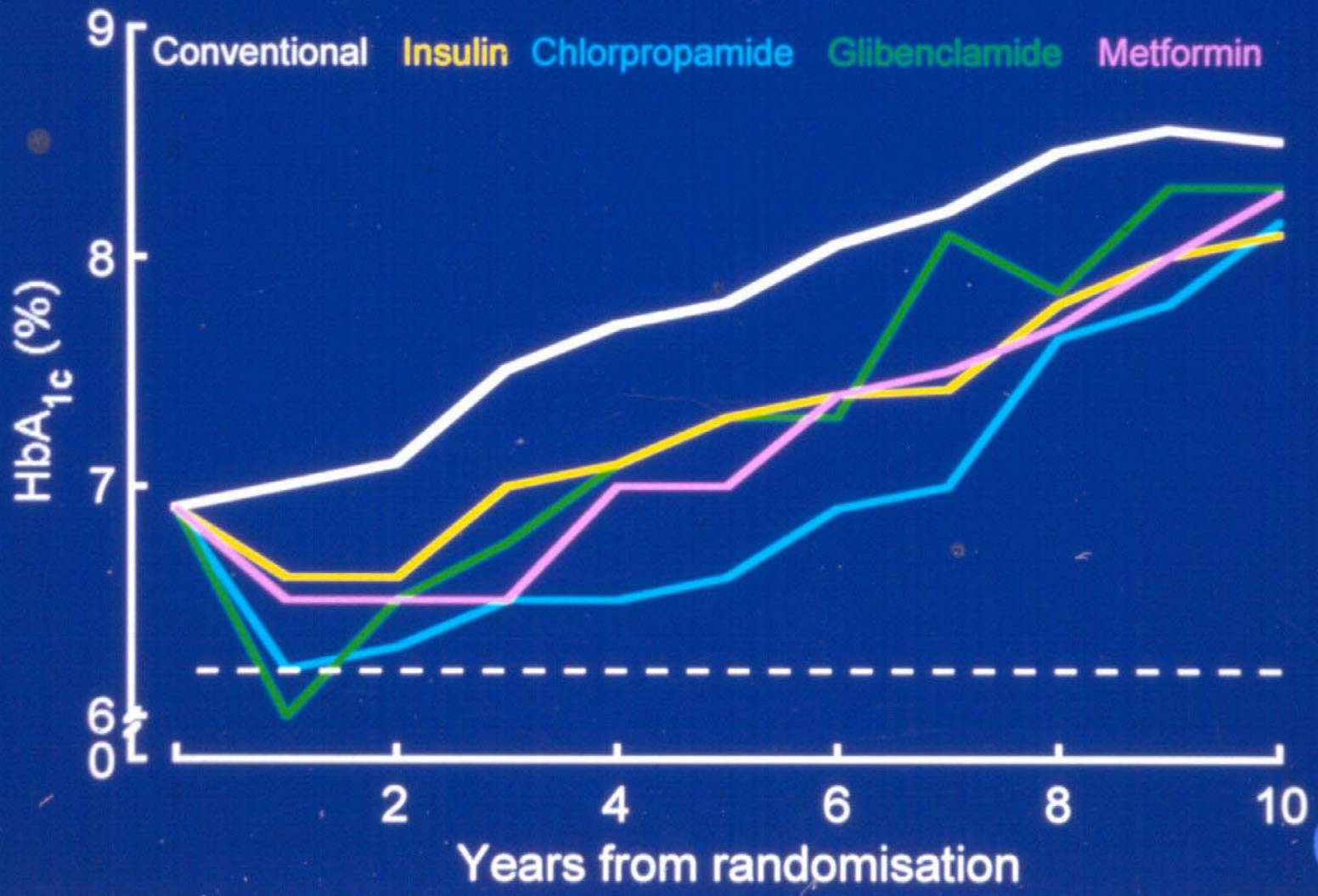
HbA_{1c}

overweight patients

cohort, median values



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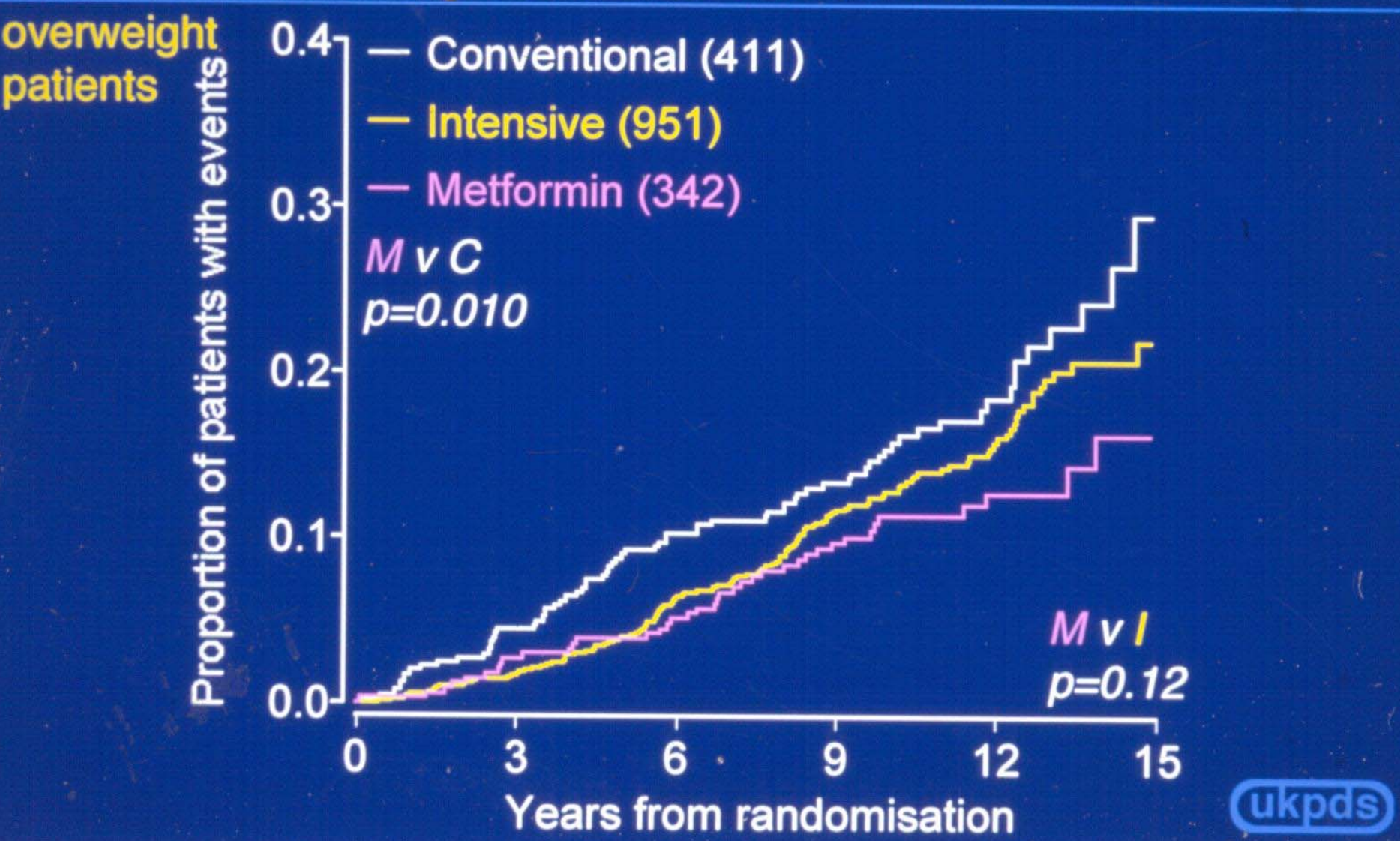
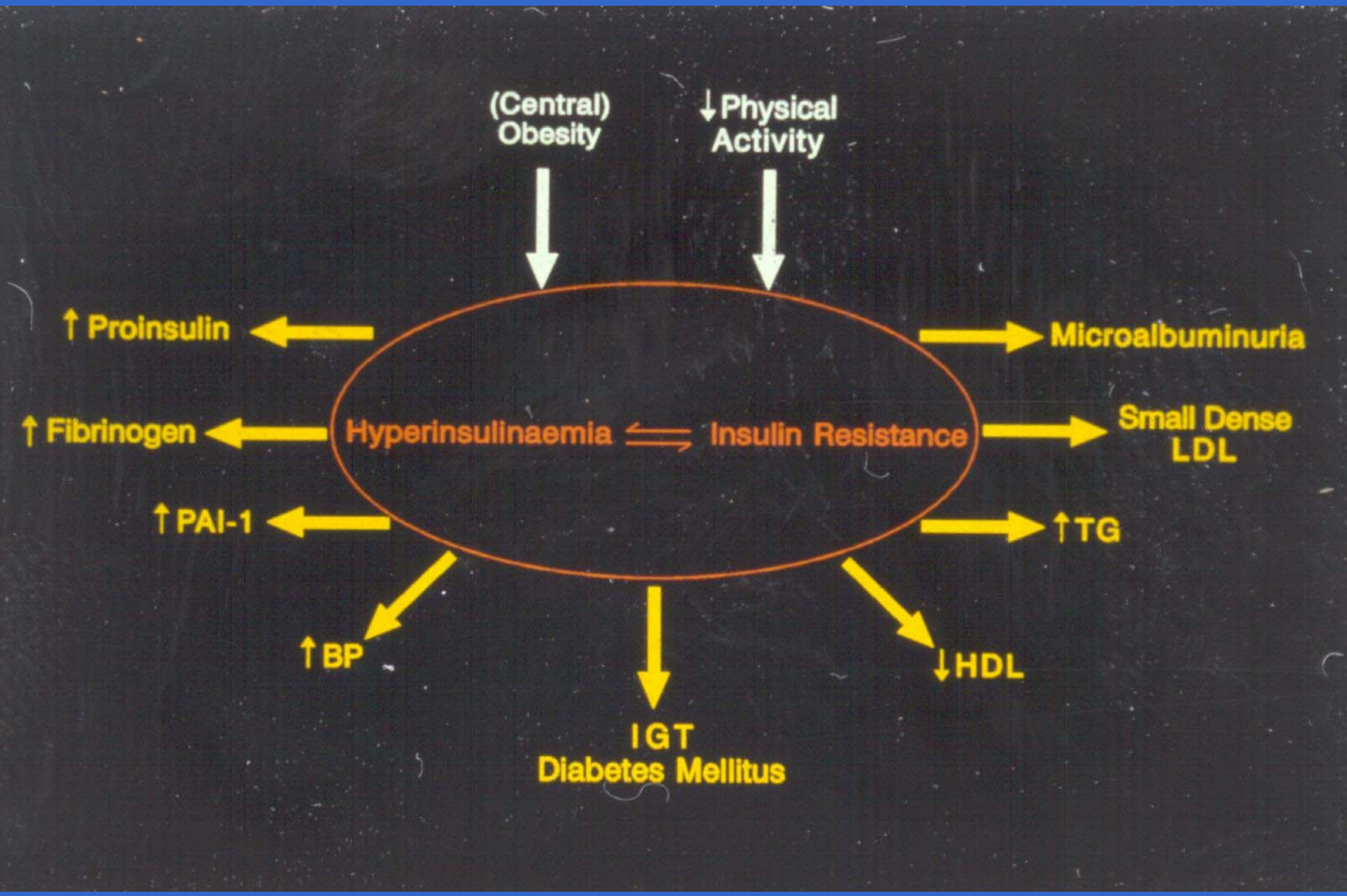
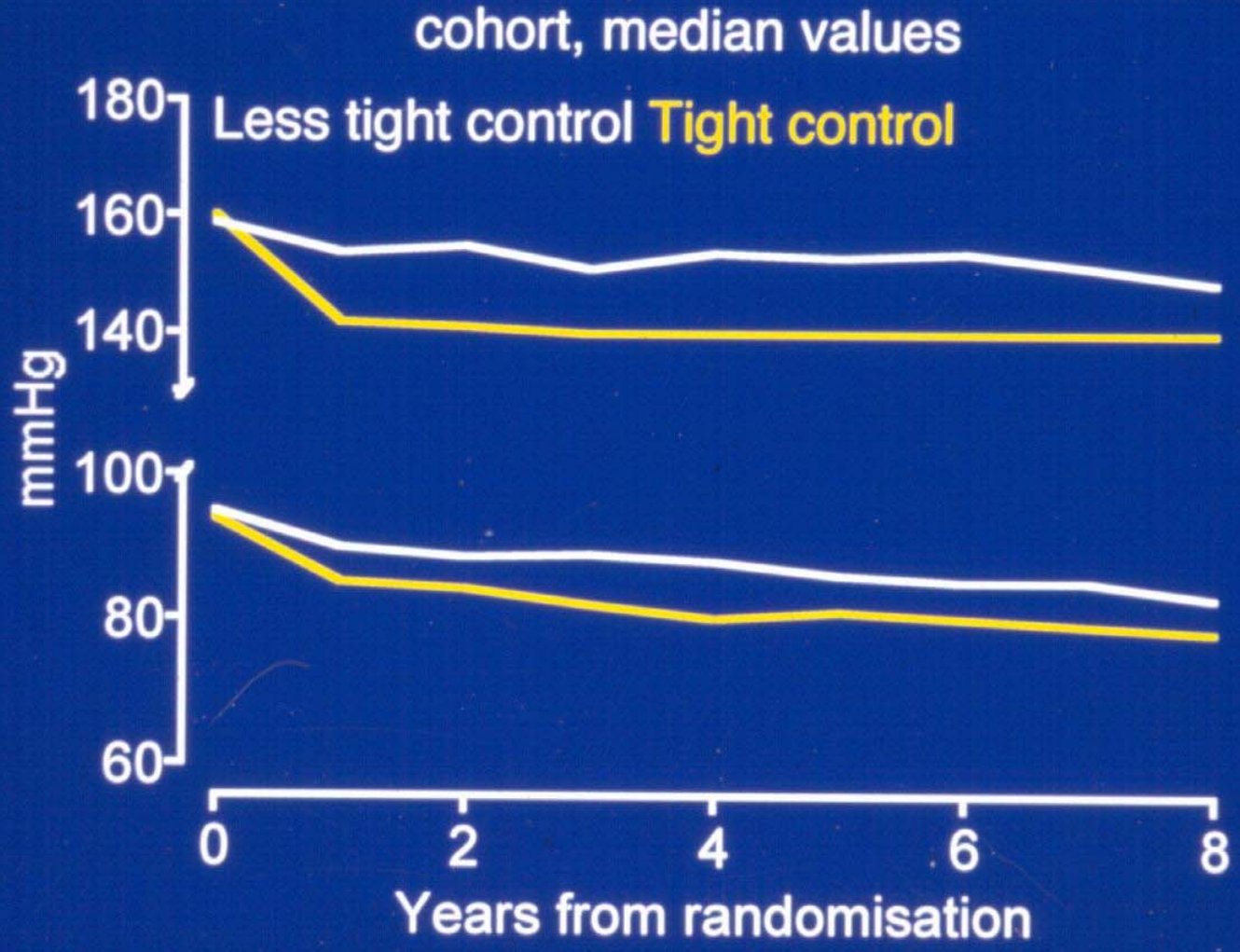
Myocardial Infarction




(Central)
Obesity
↓Physical
Activity
↑ Proinsulin
Microalbuminuria
↑ Fibrinogen
Hyperinsulinaemia ⇌ Insulin Resistance
Small Dense
LDL
↑ PAI-1
↑TG
↑BP
↓HDL
IGT
Diabetes Mellitus

Blood Pressure : Tight vs Less Tight Control



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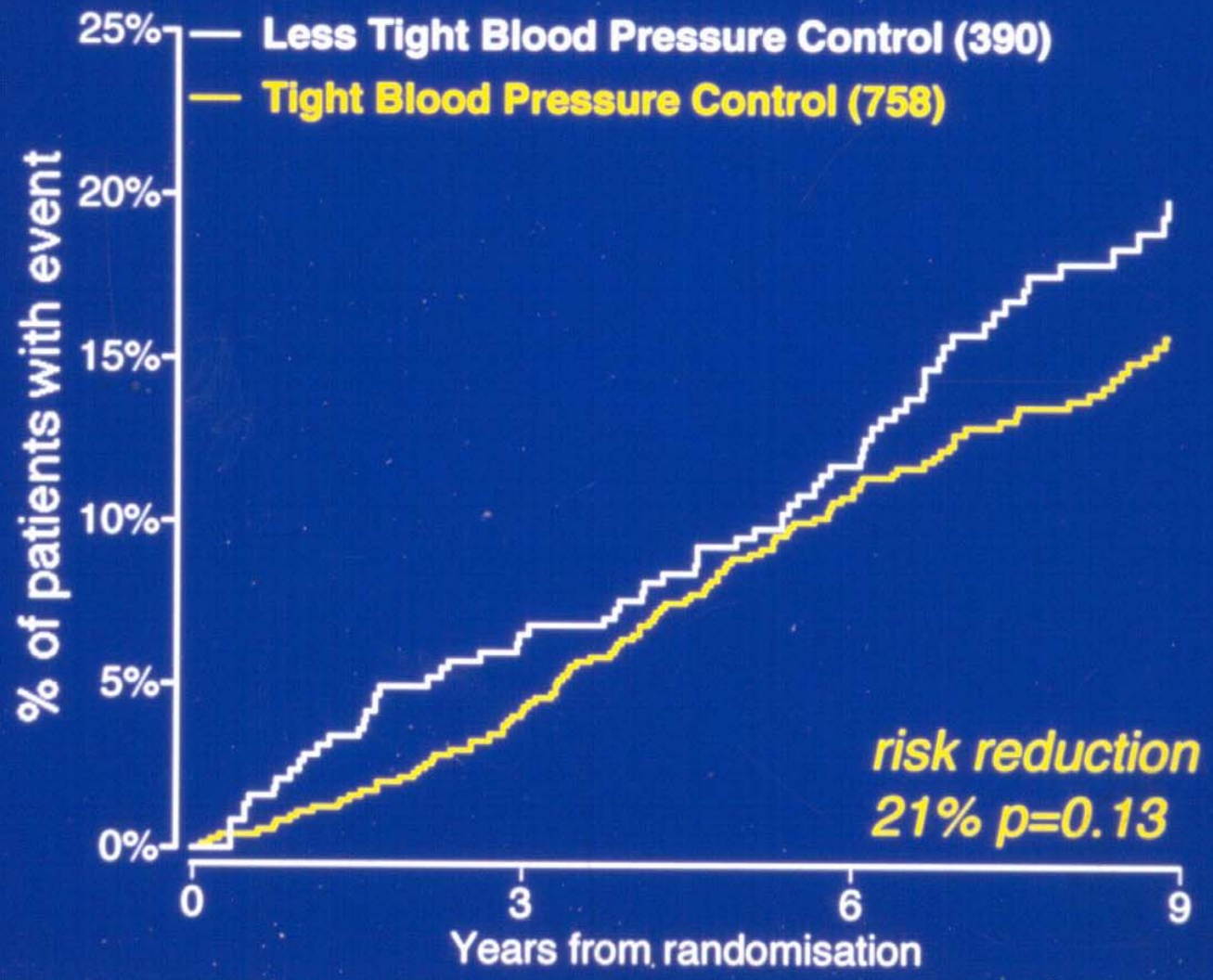
Myocardial Infarction



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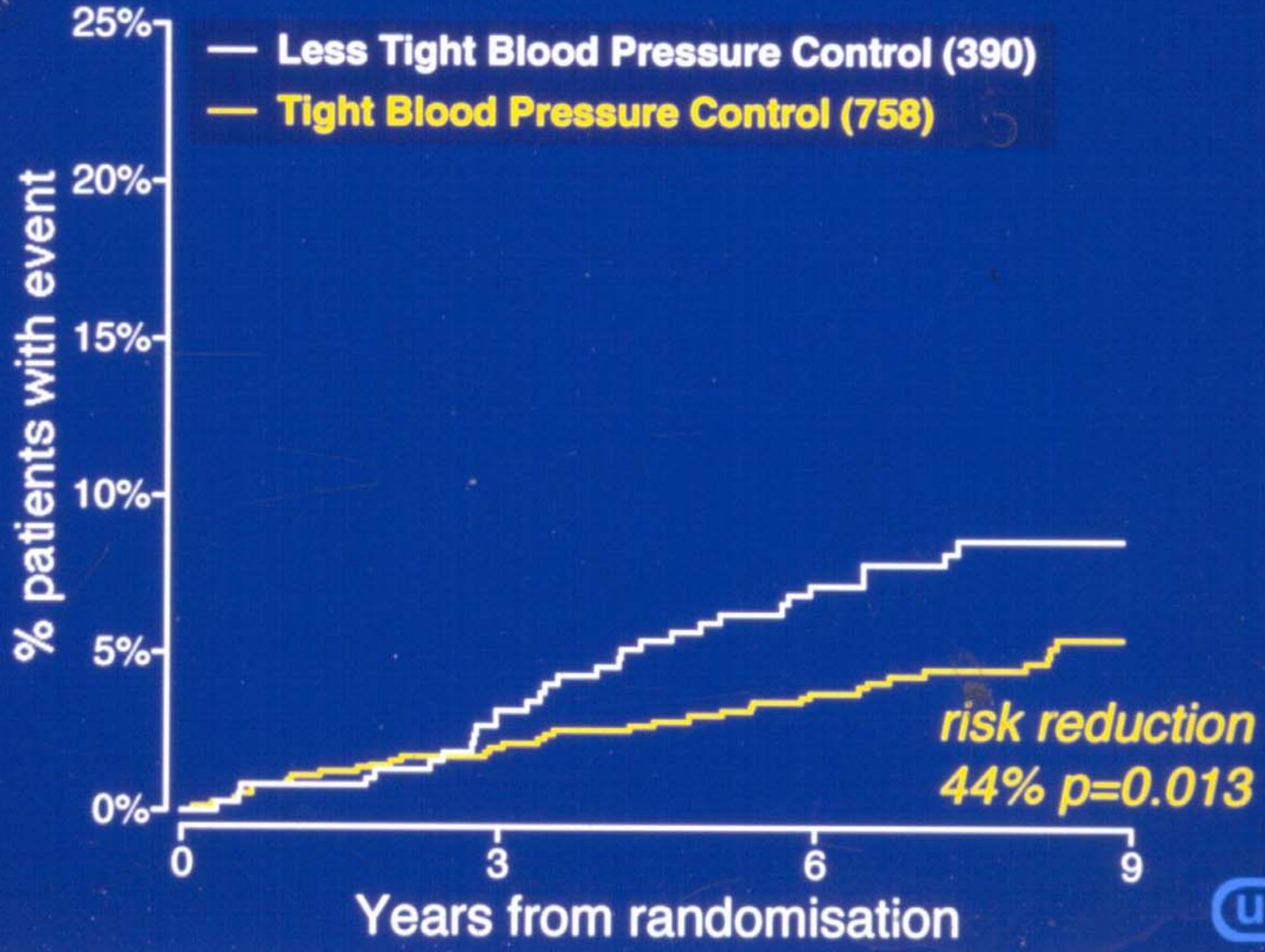
Stroke



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NUMBERS NEEDED TO TREAT FOR 10 YEARS TO PREVENT

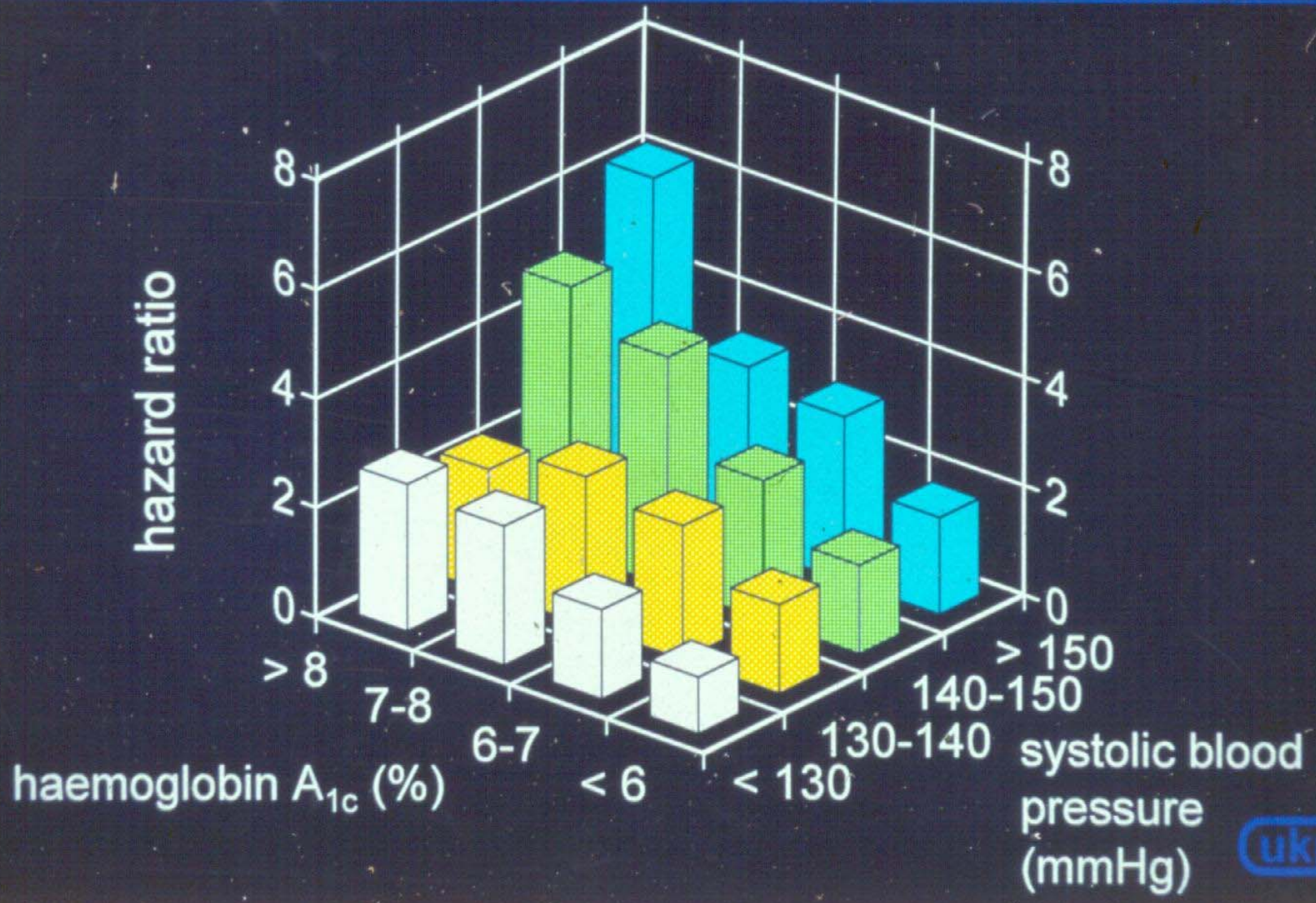
	Glucose	BP*
One patient developing diabetes-related endpoint	19.6+	6.3+
One diabetes-related death	91	15.1+
One myocardial infarction	37	20.4
One stroke	∞	19.6+

*Hypertensive subjects only (38%)

+$p<0.05$

UKPDS 38

Myocardial Infarction



Systolic Blood Pressure and Macrovascular Disease in the UKPDS

	△ risk per 10mmHg updated mean SBP	△ risk by reducing SBP by 10mmHg
Myocardial Infarction	12 (7 to 16) %	21 (-7 to 41) %
Stroke	19 (14 to 24) %	44 (11 to 65) %

UKPDS36, 2000