

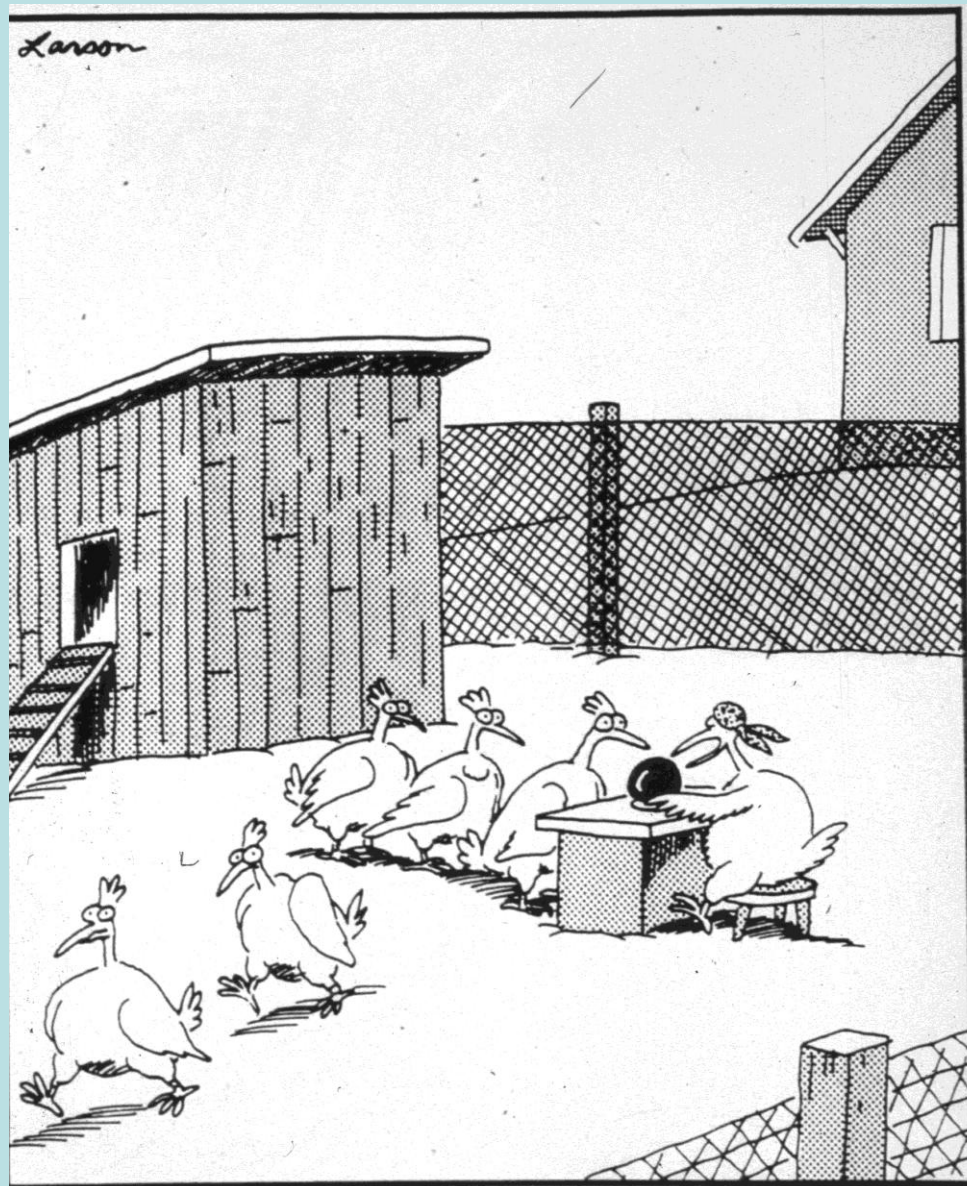
DR. GEOFFREY ROBB
Consultant Physician and Diabetologist
Epsom General Hospital

Chief Medical Officer

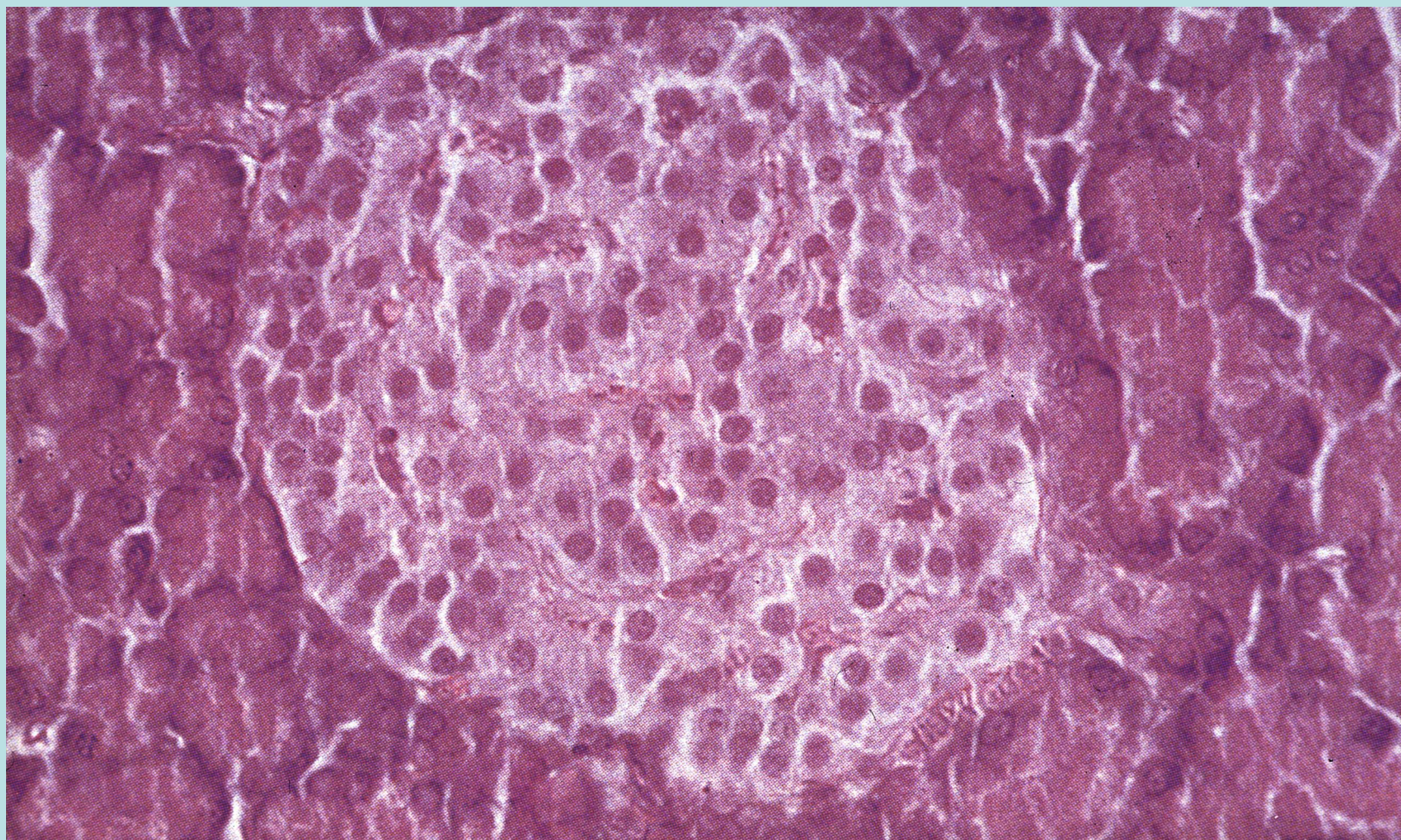
Friends Provident Life Office
Health Claims Bureau
Partnership Assurance
R.G.A (UK) Ltd

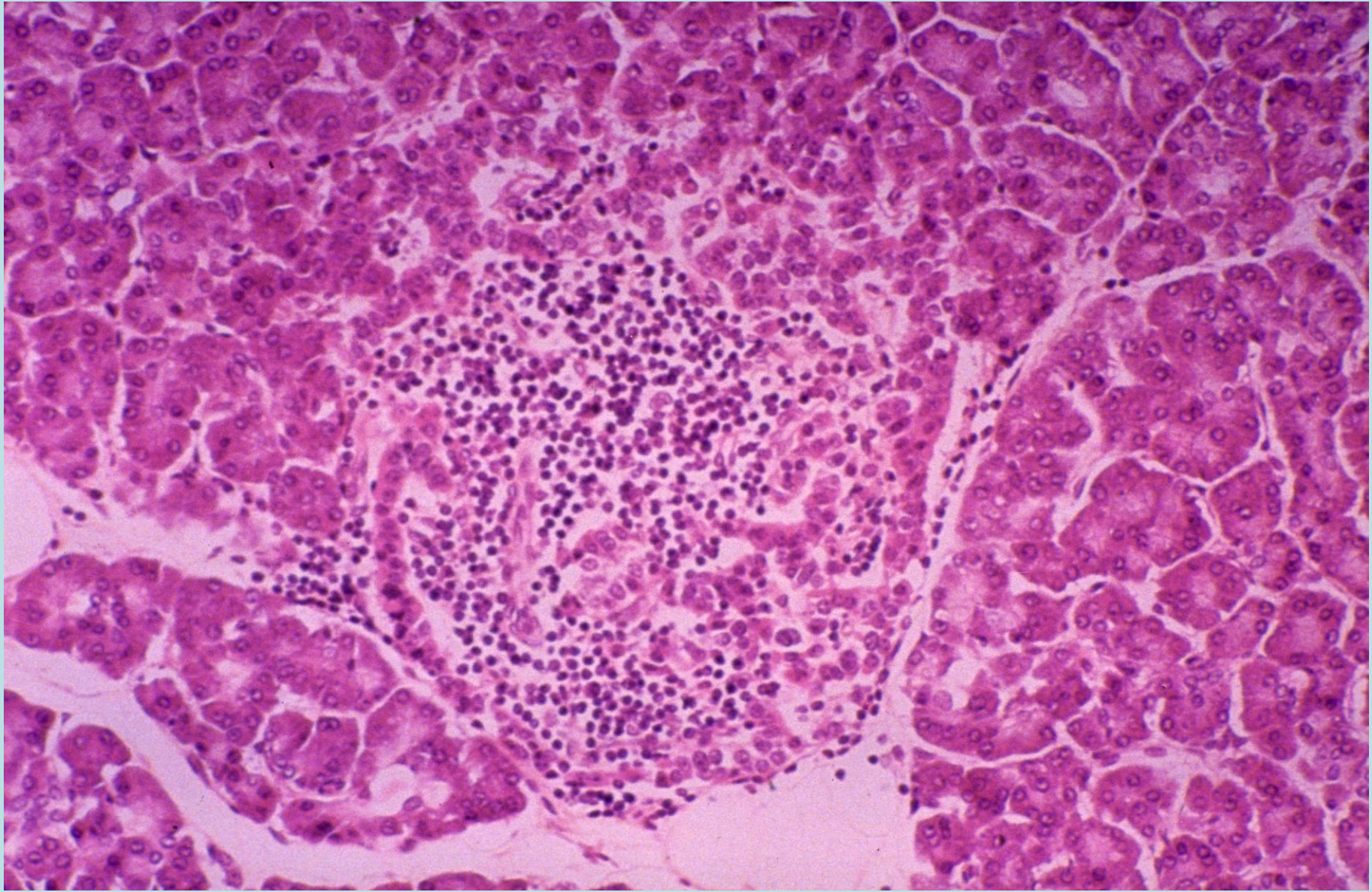
Consultant Medical Advisor

Union Provident



"Whoa! Another bad one! ... I see your severed head lying quietly in the red-stained dirt, a surprised expression still frozen in your lifeless eyes. ... Next."





CLASSIFICATION OF DIABETES MELLITUS

Type 1 (insulin dependent) diabetes

Autoimmune destruction of pancreatic beta-cells leading to absolute insulin deficiency. Usually presents in childhood or early adulthood and in those who are normal or underweight.

Type 2 (non-insulin-dependent) diabetes

Results from a combination of insulin resistance and pancreatic beta-cell dysfunction. Presents in older, usually overweight individuals. Strong genetic and environmental factors involved.

Gestational diabetes

Develops during pregnancy which then normalises once the pregnancy is over. Increased susceptibility to type 2 diabetes in later life.

Secondary diabetes

Causes include pancreatitis, induction by certain drugs (e.g. steroids), and in the developing world, malnutrition.

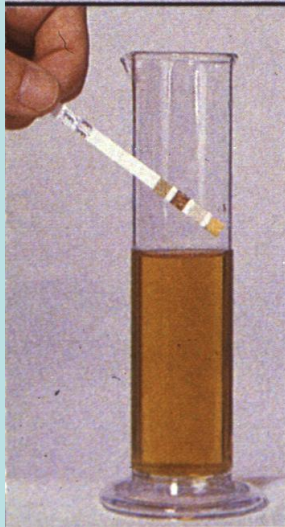
PRESENTATION OF DIABETES

metabolic



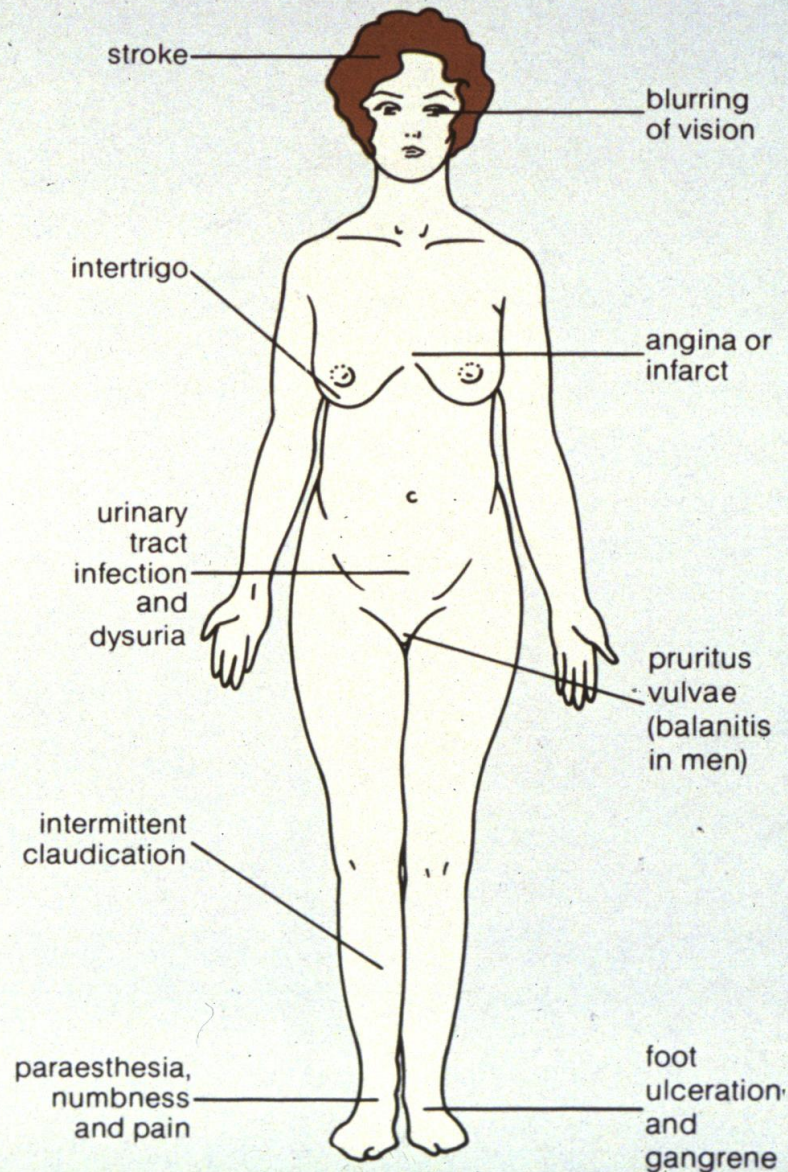
polyuria
bedwetting
thirst
weight loss
dehydration
coma

asymptomatic (routine screen)



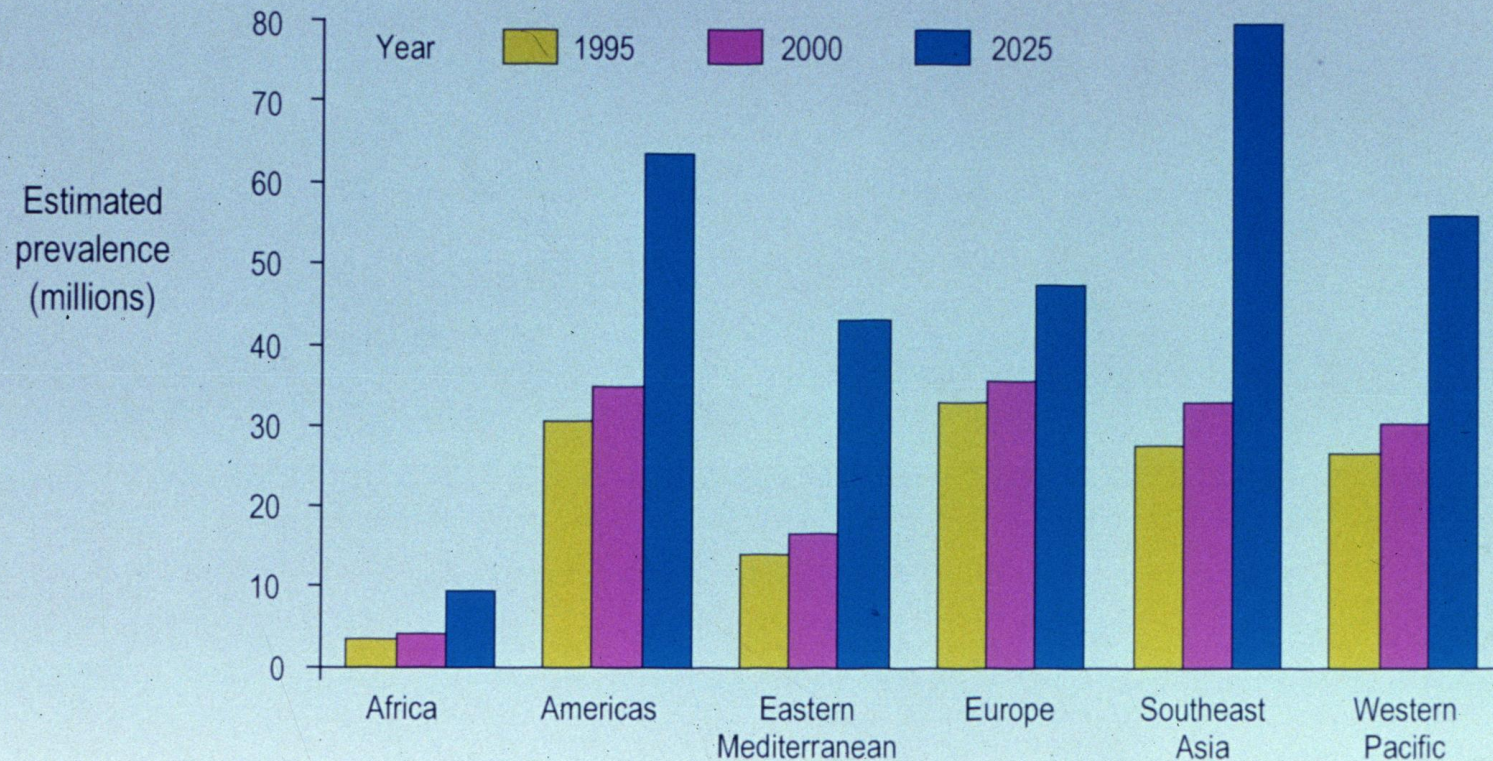
unrelated symptoms
insurance
employment
pregnancy
population survey
at risk subjects

non-metabolic

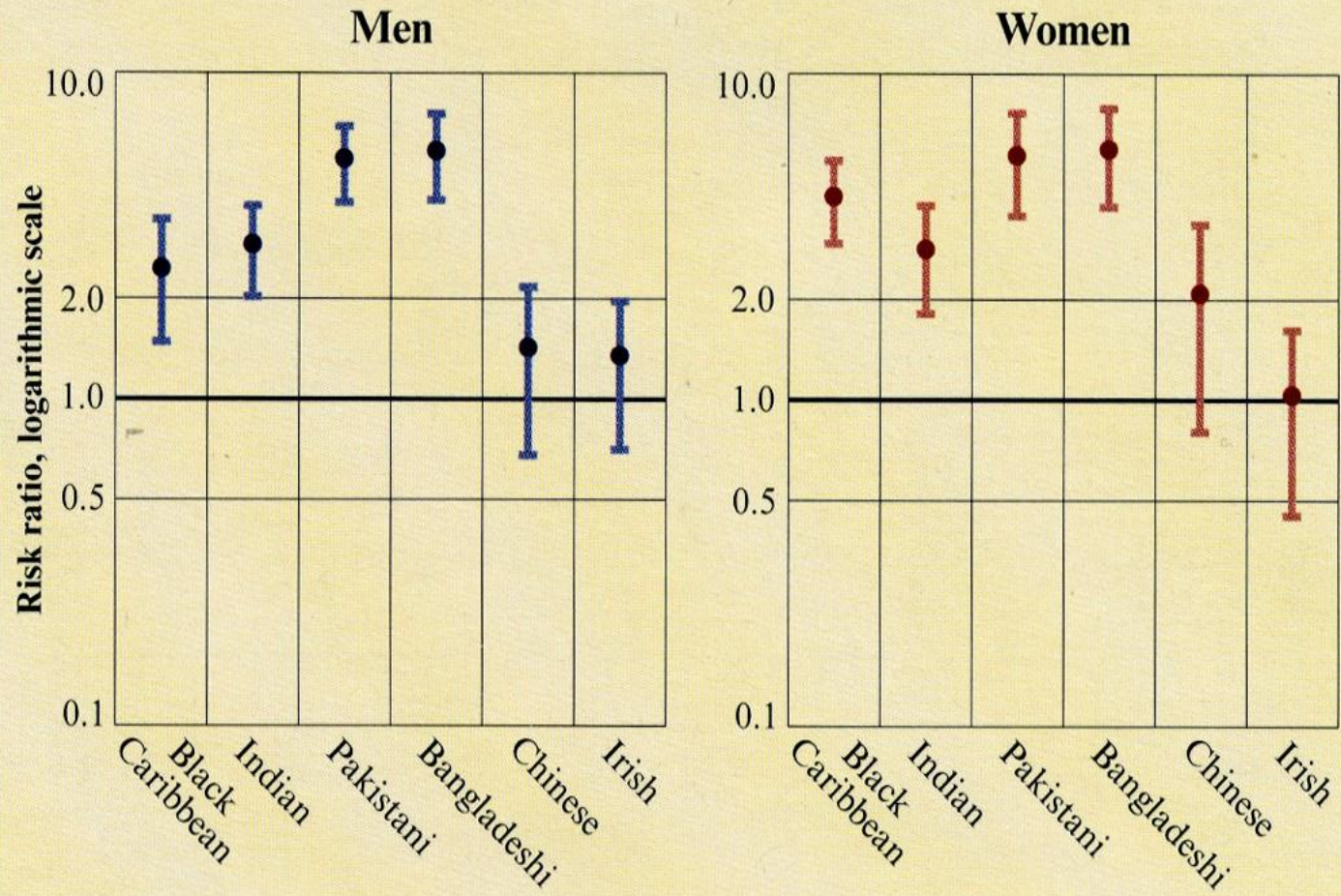


Worldwide Rates of Diabetes Mellitus

A Growing Epidemic



Prevalence of diabetes



Age-standardised. General population = 1.0. Error bars indicate 95% confidence limits.

DIAGNOSIS OF DIABETES

Fasting Blood Sugar

Under 6.1 mmol./Litre NORMAL

6.1 – 6.9

Impaired Glucose Tolerance

Over 7.0

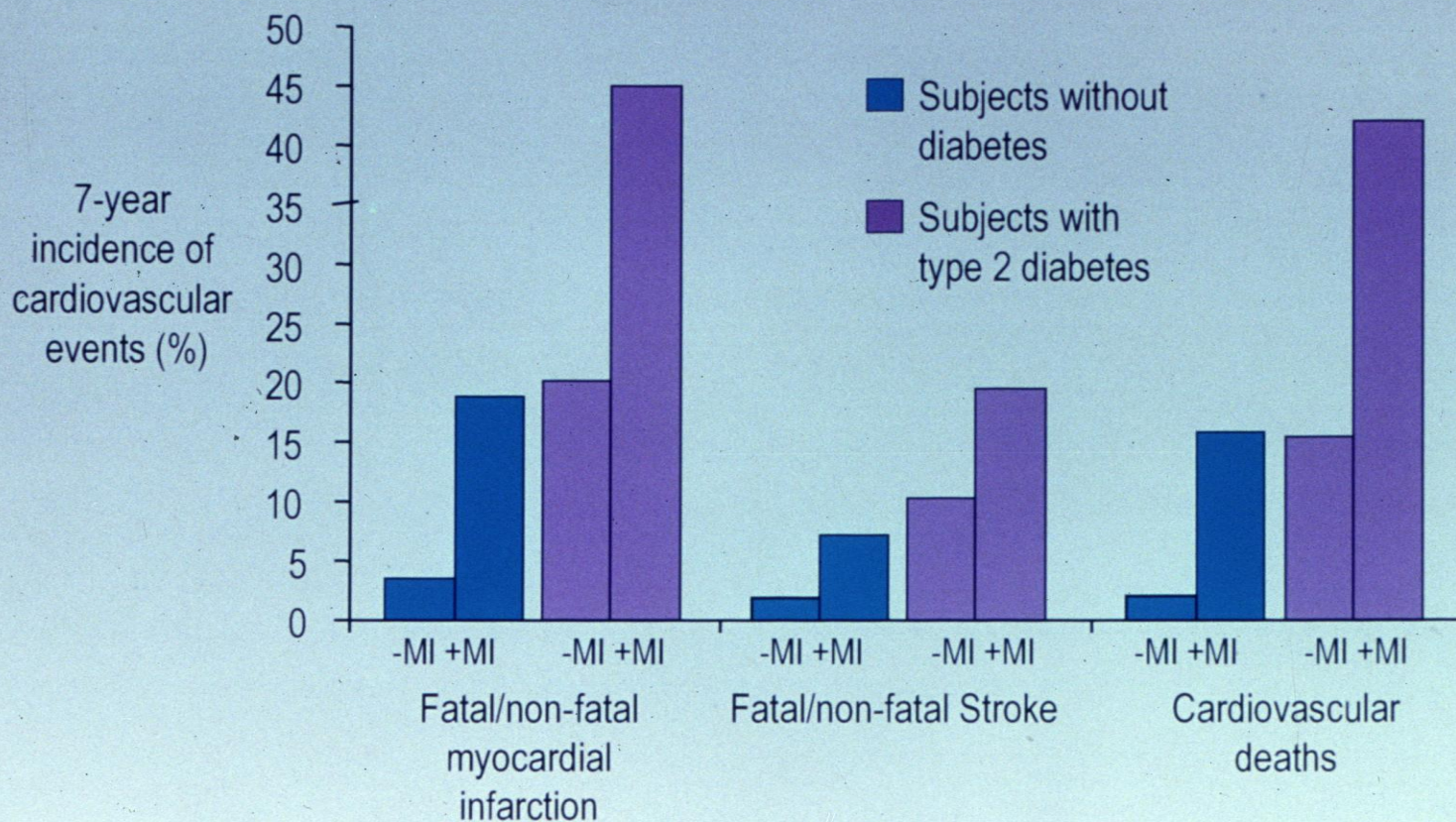
Diabetes

Prevalence of impaired glucose tolerance
diagnosed by WHO criteria in selected studies

Study	Age (years)	Prevalence rate (%)	
		Men	Women
NHANES II [6], <i>n</i> = 3772, 1976-80; general US population	20-44	4.7	7.8
	45-54	13.1	16.3
	55-64	17.2	13.4
	65-74	22.8	22.7
Rural Italy [7], <i>n</i> = 1154, 1981-82	18-39	2.0	3.4
	40-59	5.1	9.1
	60+	9.2	12.1
Western Australia [8], <i>n</i> = 3197, 1981	35-44	1.8	1.3
	45-54	3.6	2.3
	55-64	5.1	3.7
	65-74	7.8	5.9
	75+	7.9	11.8
Mauritius [9], <i>n</i> = 4931, 1987; Indian, Creole and Chinese	25-34	6.8	15.5
	35-44	16.3	19.9
	45-54	15.7	22.1
	55-64	19.5	24.7
	65-74	24.0	26.4

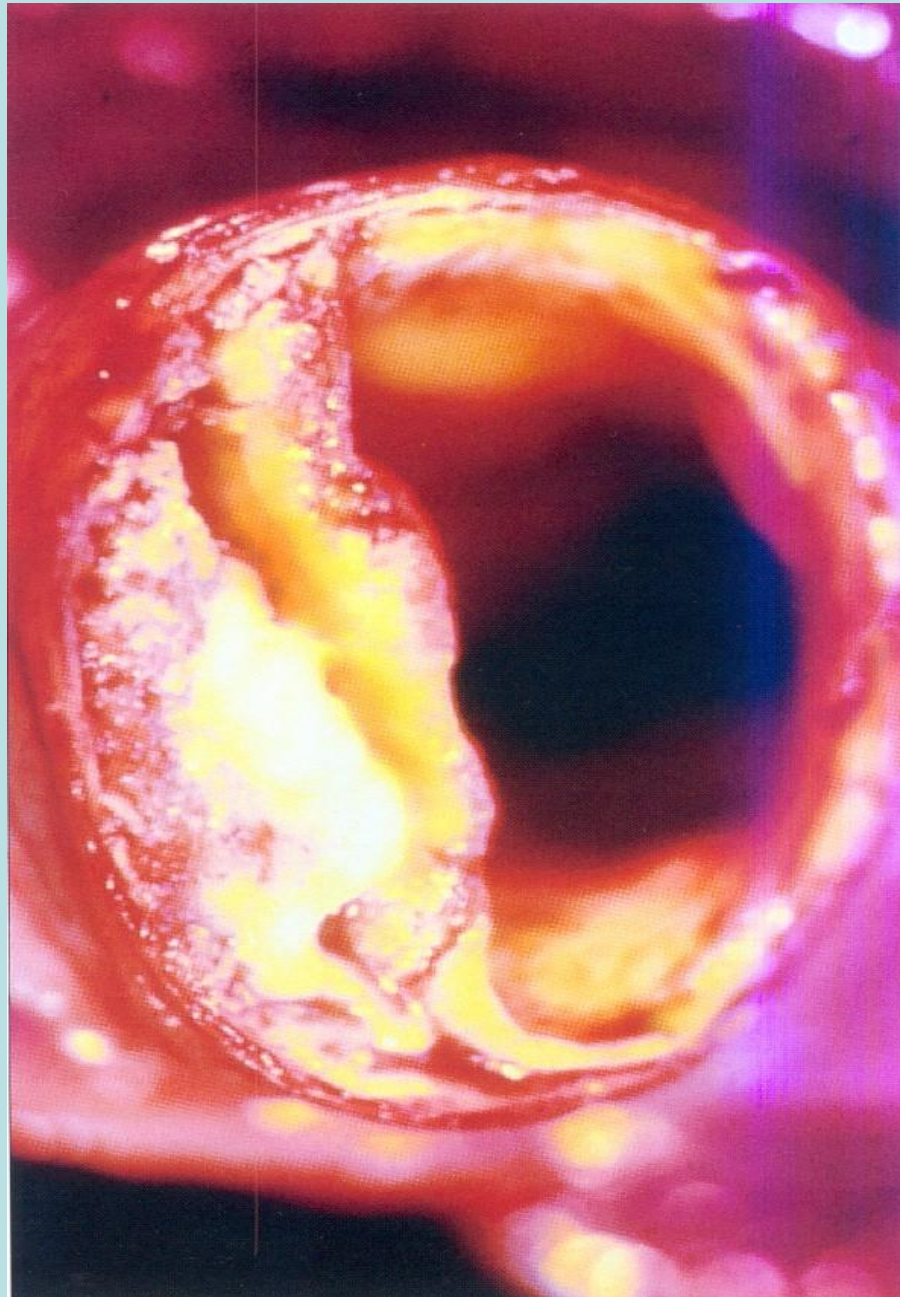
Adapted from reference 10, with permission of the American Diabetes Association, Inc.

High Risk of Cardiovascular Events in Type 2 Diabetes



- MI = No prior myocardial infarction
+ MI = Prior myocardial infarction

Haffner SM et al. *N Engl J Med* 1998; 339: 229-234



Mortality rate for diabetic and non-diabetic adults in NHANES I 1971-1993

Rate per 1000 person years

<u>All subjects</u>	<u>Diabetics</u>	<u>Non Diabetics</u>	<u>Data Ratio</u>
25-44	12.4	3.4	3.6
45-64	39.7	18.1	2.2
65-74	89.7	60.1	1.5

Risk factors for Coronary Artery Disease

- **Control of diabetes**
 - **Control of blood pressure**
 - **Family history**
 - **Cigarette smoking**
 - **Microalbuminuria**
 - **Hyperlipidaemia**
-
- **Obesity**
 - **Exercise**

DCCT – Reduction in Complications

Retinopathy	63 %
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Microalbuminuria	54 %
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Neuropathy	60 %
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High LDL	34 %
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UK PDS – reduction in risk with tight BP control

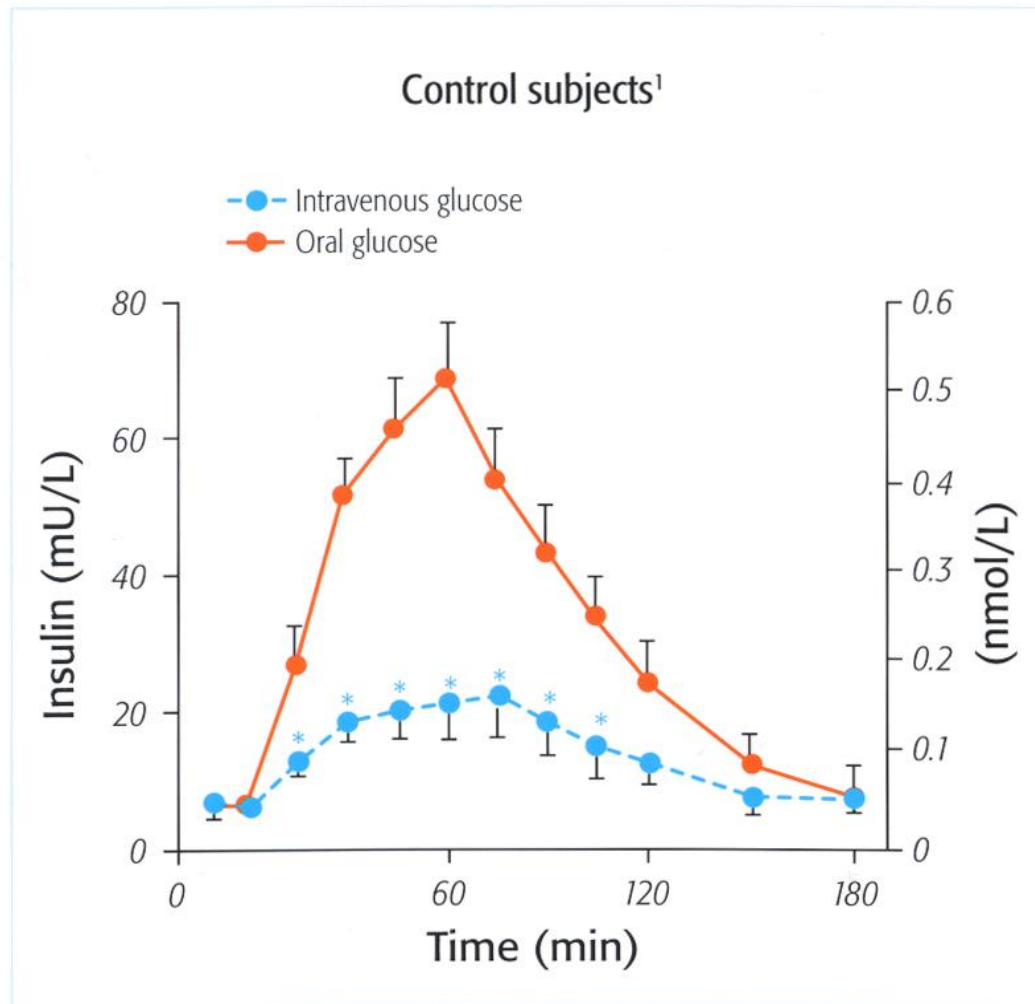
Any clinical end point	24 %	P = 0.0046
Death from macrovascular disease	32 %	P = 0.019
Myocardial Infarction	21 %	P = 0.13
Stroke	44 %	P = 0.013
Heart failure	56 %	P = 0.0043
Microvascular disease	37 %	P = 0.0001

Diabetes

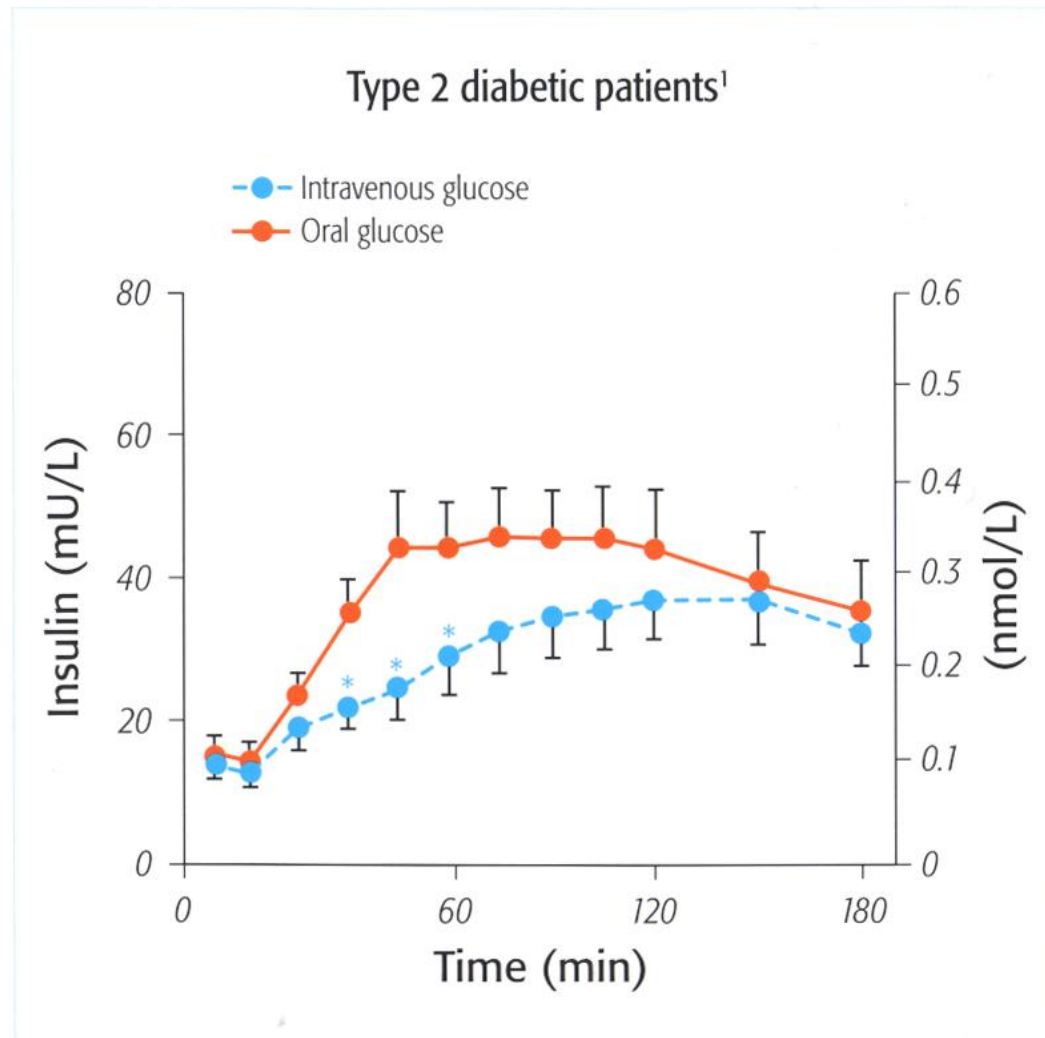
How do we treat?

1. Diet and Exercise
2. Diet and Exercise and Tablets
 - Sulphonylurea, e.g Gliclazide
 - Metformin
 - Rosiglitazone – Reduces insulin resistance
 - Nateglinide – Increases insulin secretion
 - Orlistat
3. Insulin - Twice daily

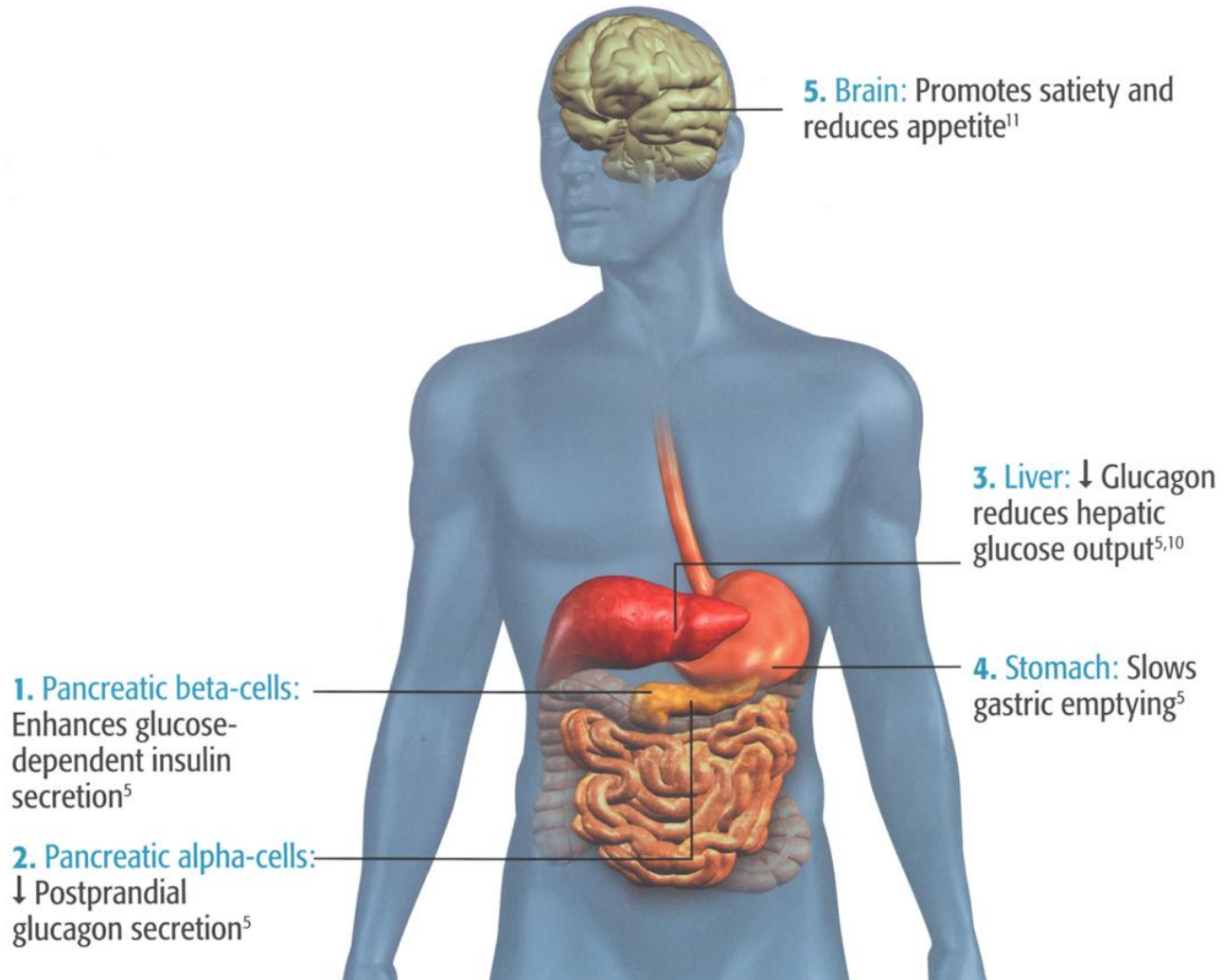
The incretin effect – beta-cell response to oral vs IV glucose

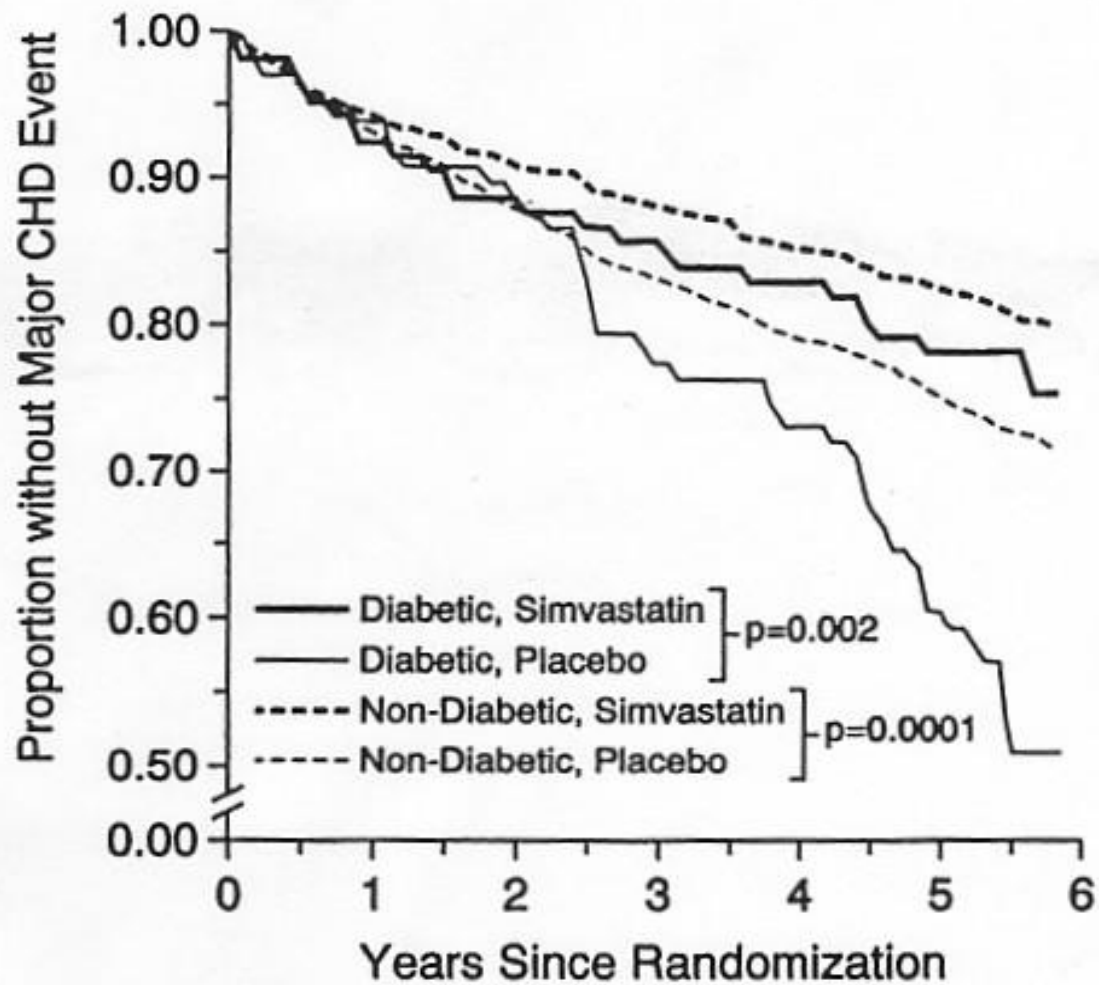


The incretin effect is reduced in patients with type 2 diabetes



Upon ingestion of food, GLP-1 is secreted by the intestine





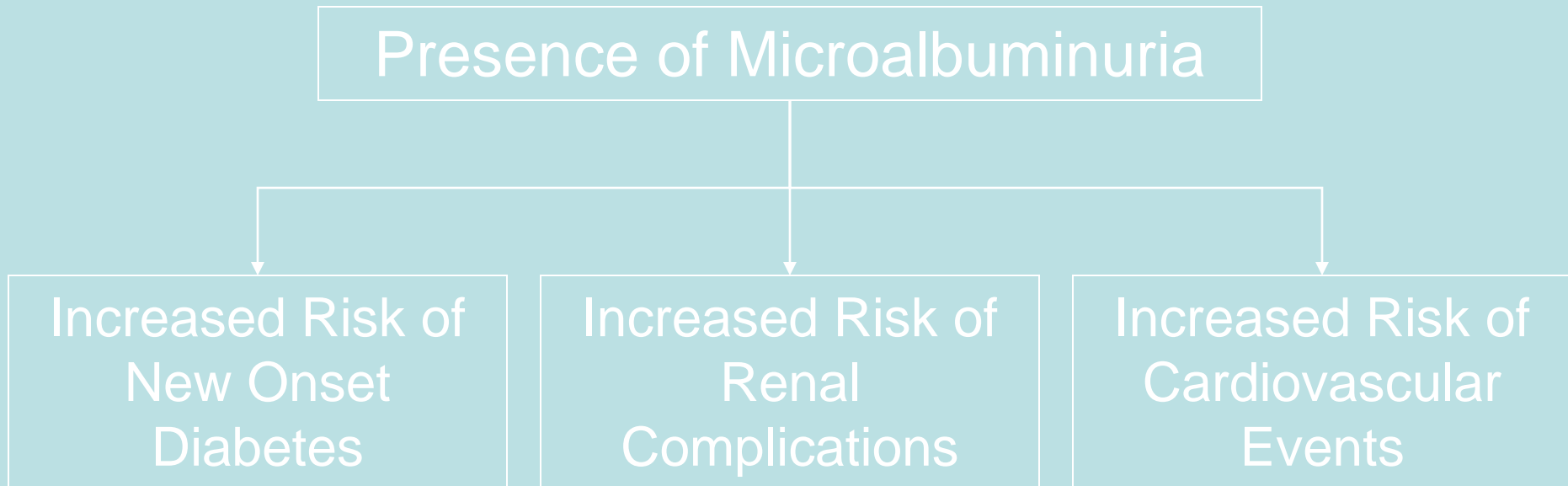
What is Microalbuminuria?

Definitions and prevalence

- Levels of urinary albumin above the normal range, but lower than dipstick-positive proteinuria below are termed microalbuminuria
- Microalbuminuria is found in:
 - 5-7% of the 'healthy' population
 - 12-30% of the hypertensive population

	Morning urine sample (mg/l)	Morning urine sample – Albumin to Creatinine Ratio (mg/mmol)
Normal	<20	Males <2.5 Females <3.5
Microalbuminuria	20-200	Males 2.5-25 Females 3.5-25
Macroalbuminuria (proteinuria)	>200	Males >25 Females >25

Microalbuminuria: both risk marker and independent risk factor



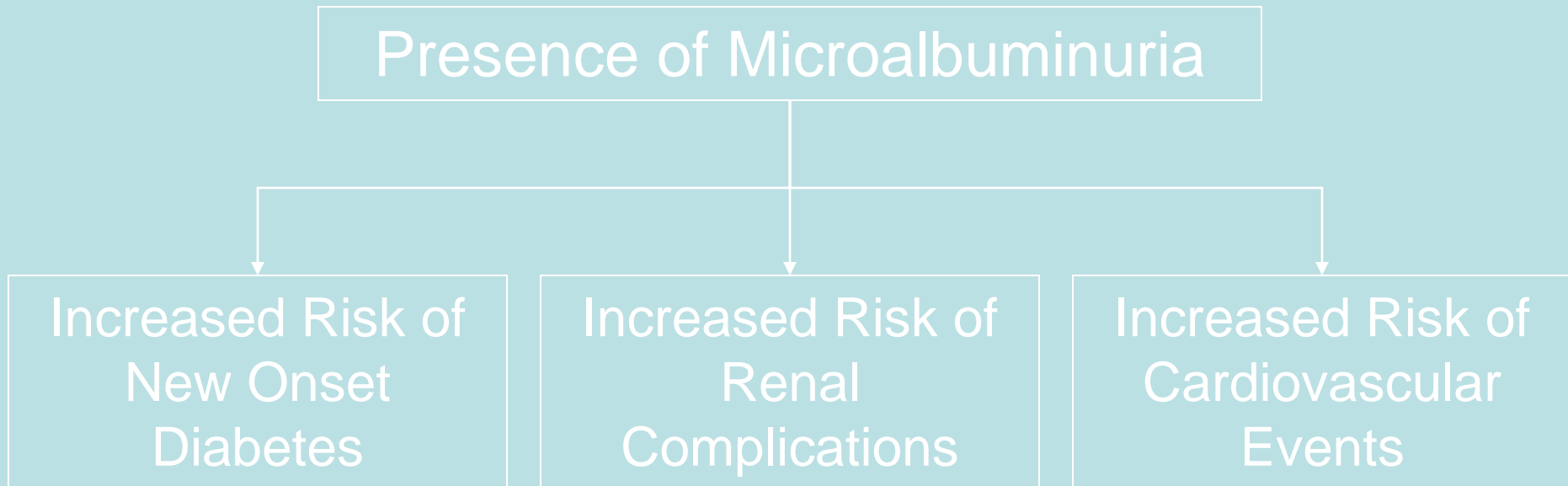
Microalbuminuria: independent of BP

- Treatments can have an independent effect on blood pressure and urinary albumin levels:
 - Urinary albumin levels are reduced in patients with diabetes, independent of the reduction in blood pressure
 - Patients whose BP responds but albumin level does not could be candidates for dual blockade

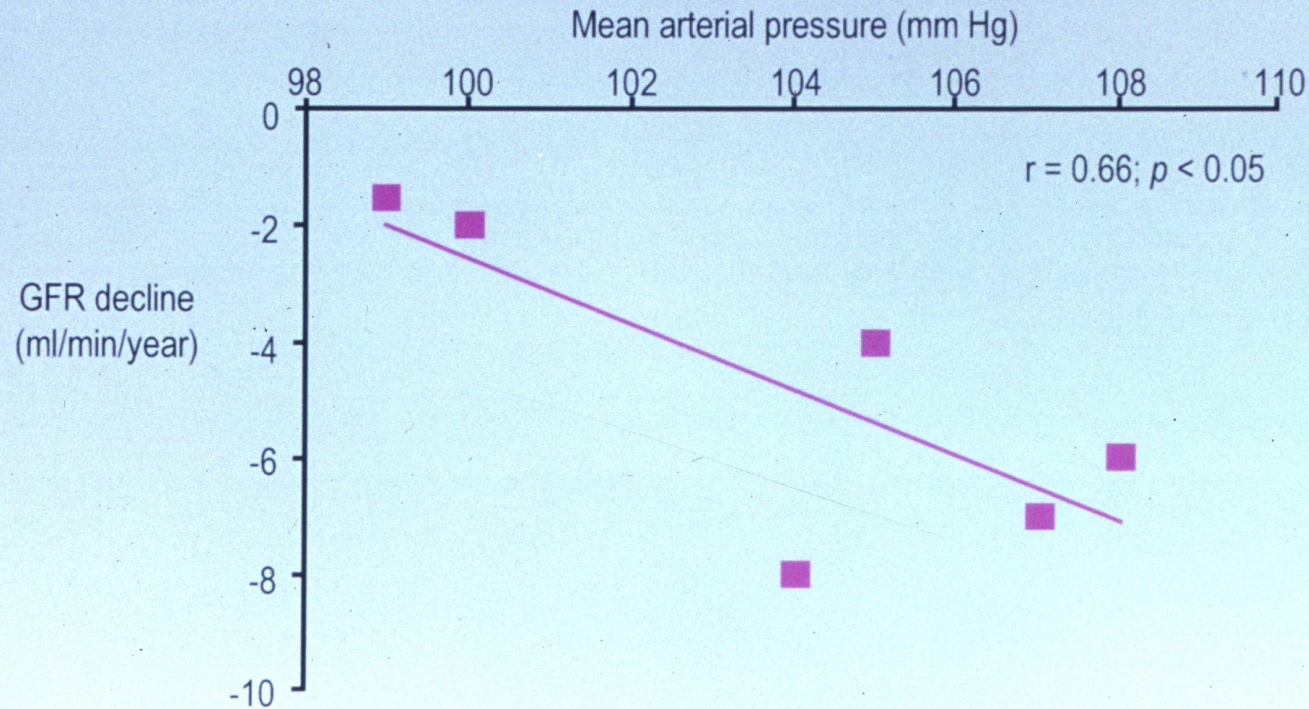
Case Study 3 – Management

- **Q** Whose patient is he anyway?
- **A** Primary Care Physician
- **B** Cardiologist
- **C** Nephrologist
- **D** Diabetologist

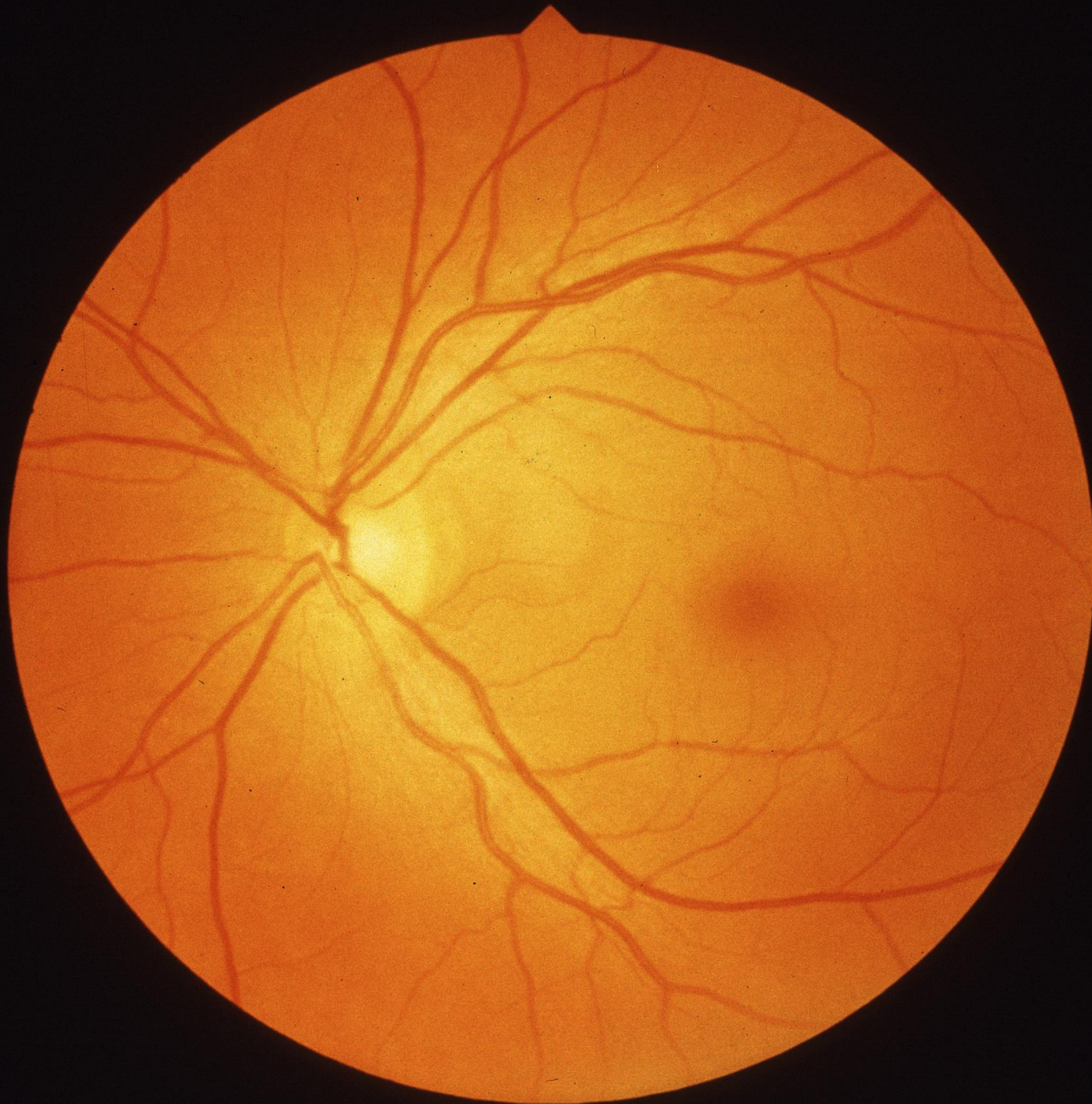
Microalbuminuria: both risk marker and independent risk factor



Slower Decline in Renal Function with Lower Blood Pressure Goals



Results of studies ≥ 3 years in patients with type 2 diabetic nephropathy.

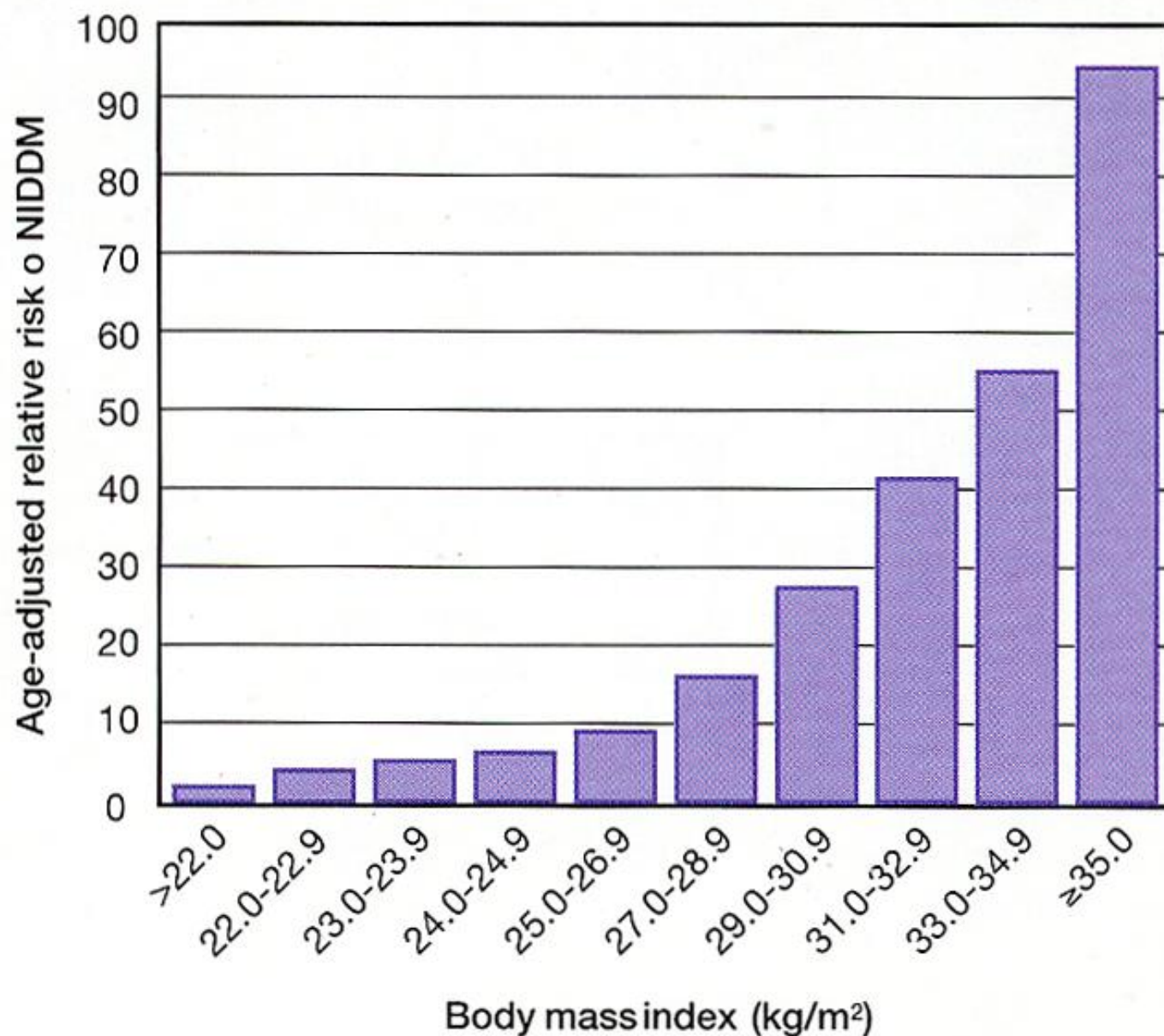








Relative risk of obesity with increasing BMI.
Adapted with permission from Colditz GA et al, 1997⁹.



Ordinary Rates for Diabetics?

- **Diagnosis at least three years ago**
- **Over 35**
- **Male**
- **Good Family History**
- **Normal body weight (BMI 19-23)**
- **Non Smoker**
- **BP Normal (less than 125/80)**
- **HbA1C under 6%**
- **No microalbuminuria**
- **No retinopathy**
- **Total cholesterol less than 5 mmol/l**
- **LDL cholesterol less than 3 mmol/l**
 - **on treatment if necessary**
- **Regular attender at good hospital based diabetic clinic**

? Married ? Activity

THYROID DISORDERS

HYPERTHYROIDISM

Diffuse Toxic Goitre (Graves Disease)

Toxic Multinodular Goitre

Thyroiditis

HYPOTHYROIDISM

Thyroiditis

After surgery

After radio-iodine

Drugs

- Anti-thyroid drugs
- Lithium
- Amiodarone

THYROID CANCER