

Achieving Good Glycemic Control



International Diabetes Federation



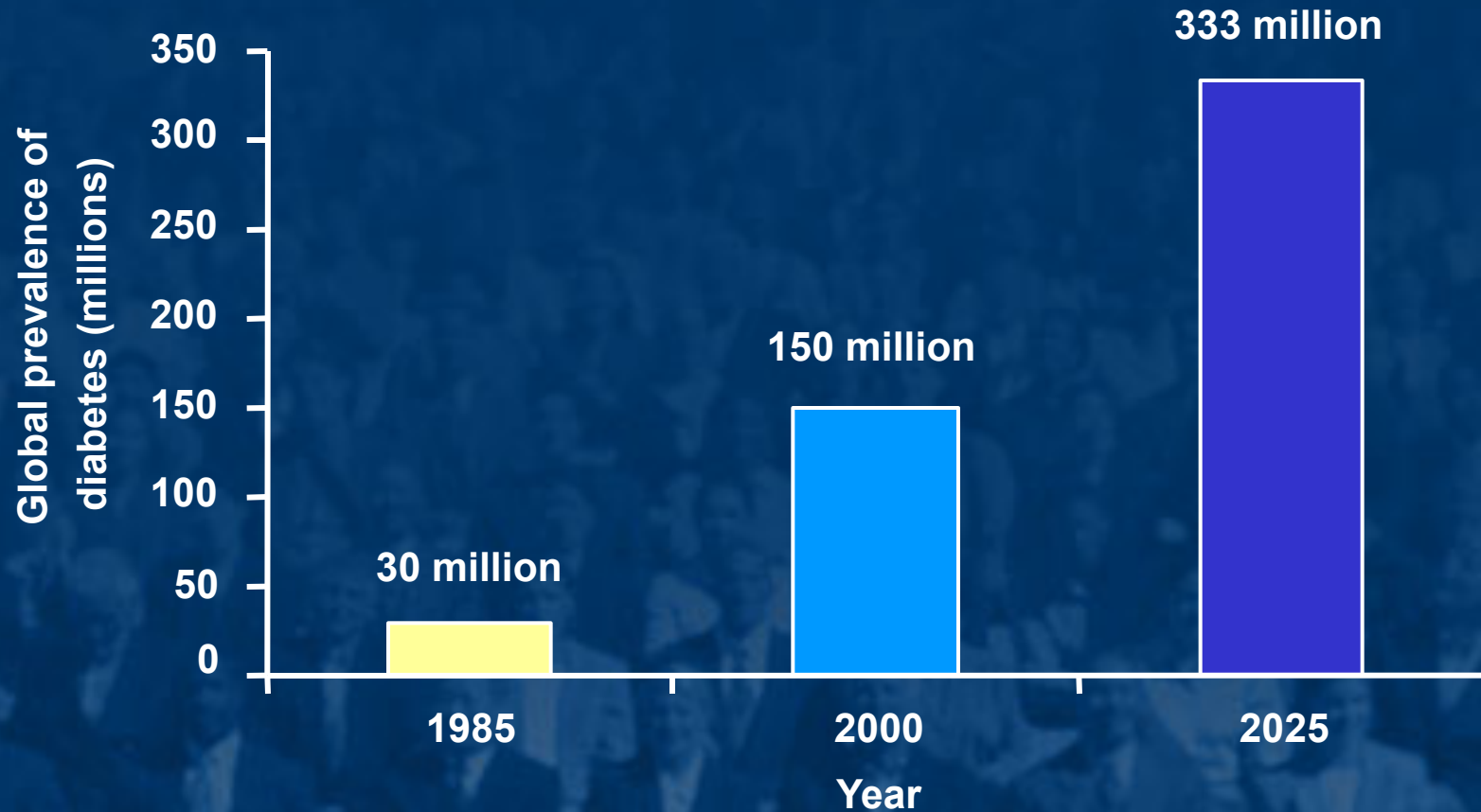
Aim

Provide practical guidance on improving diabetes care through highlighting the need to:

- treat to glucose targets
- intensively monitor glycemia
- use a holistic approach to treatment
- involve experts in diabetes management

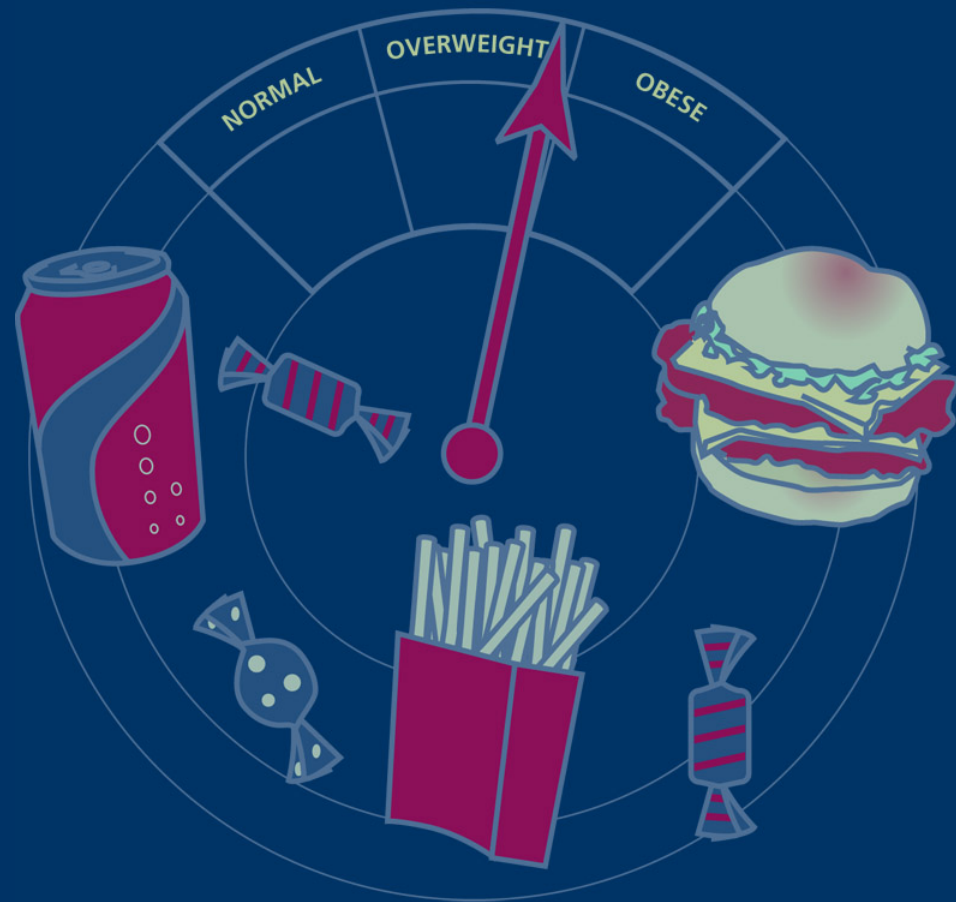
Type 2 diabetes: a global call to action

Type 2 diabetes accounts for 85–95% of diabetes cases



Obesity is a key driver of the diabetes epidemic

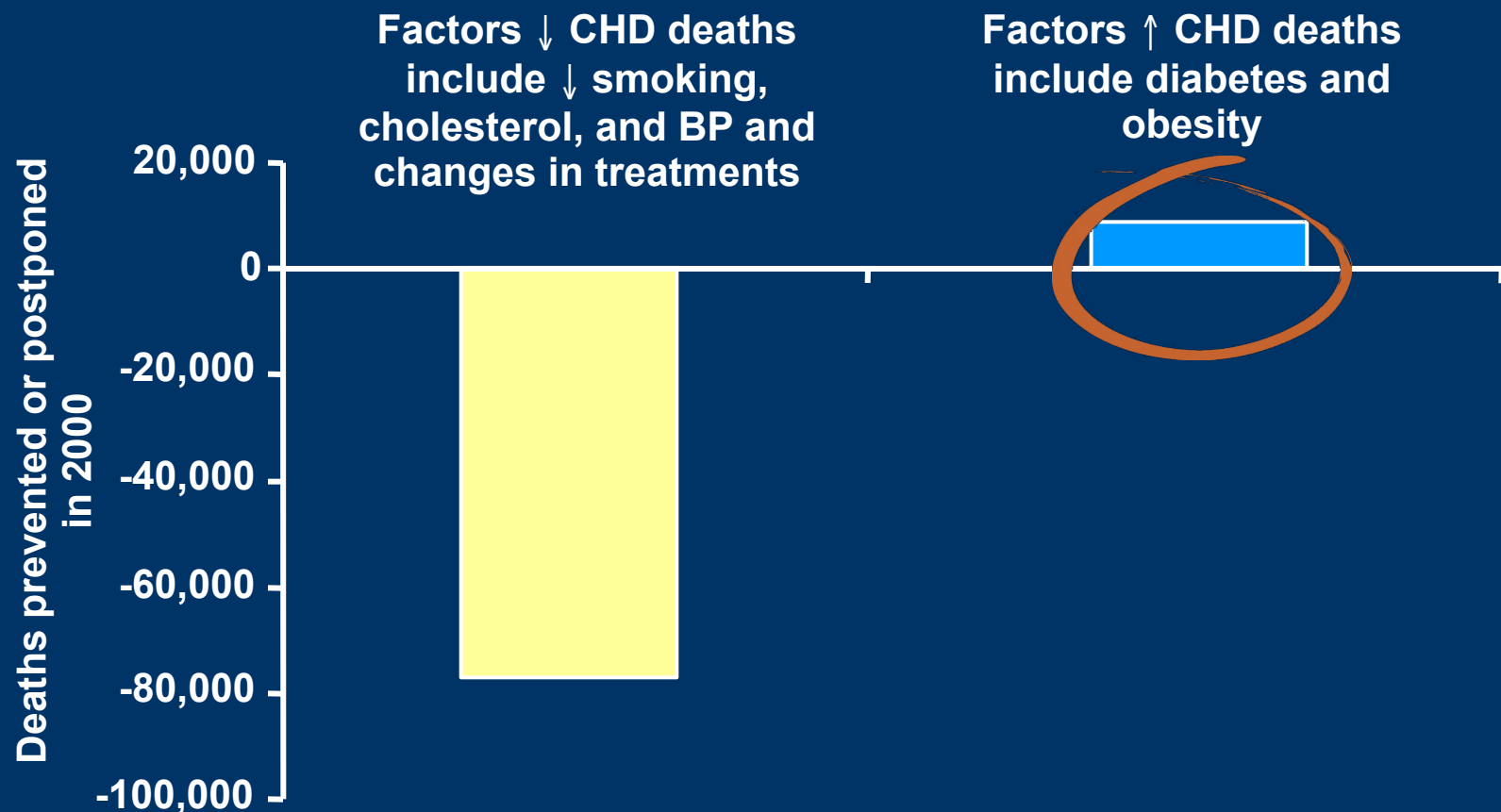
- 50–65% of the general population are obese or overweight¹
- The risk of developing type 2 diabetes increases with increasing weight²
- It is estimated that half of all diabetes cases would be eliminated if weight gain could be prevented³



¹<http://www.idf.org/home/>; ²Mokdad AH, et al. *JAMA* 2003; 289:76–79.

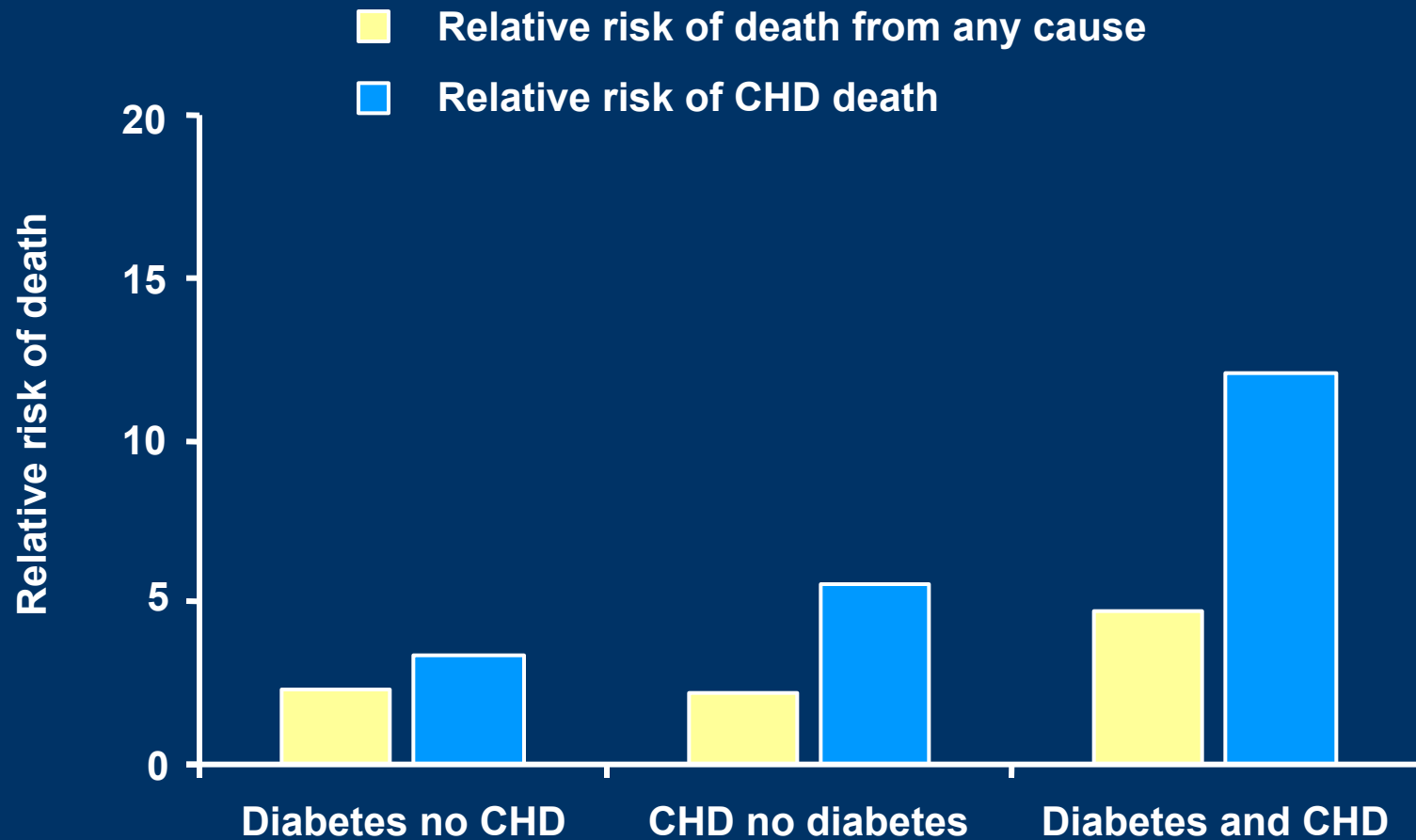
³Knowler WC, et al. *N Engl J Med* 2002; 346:393–403.

Despite falling CHD mortality rates, diabetes increases the risk of CHD



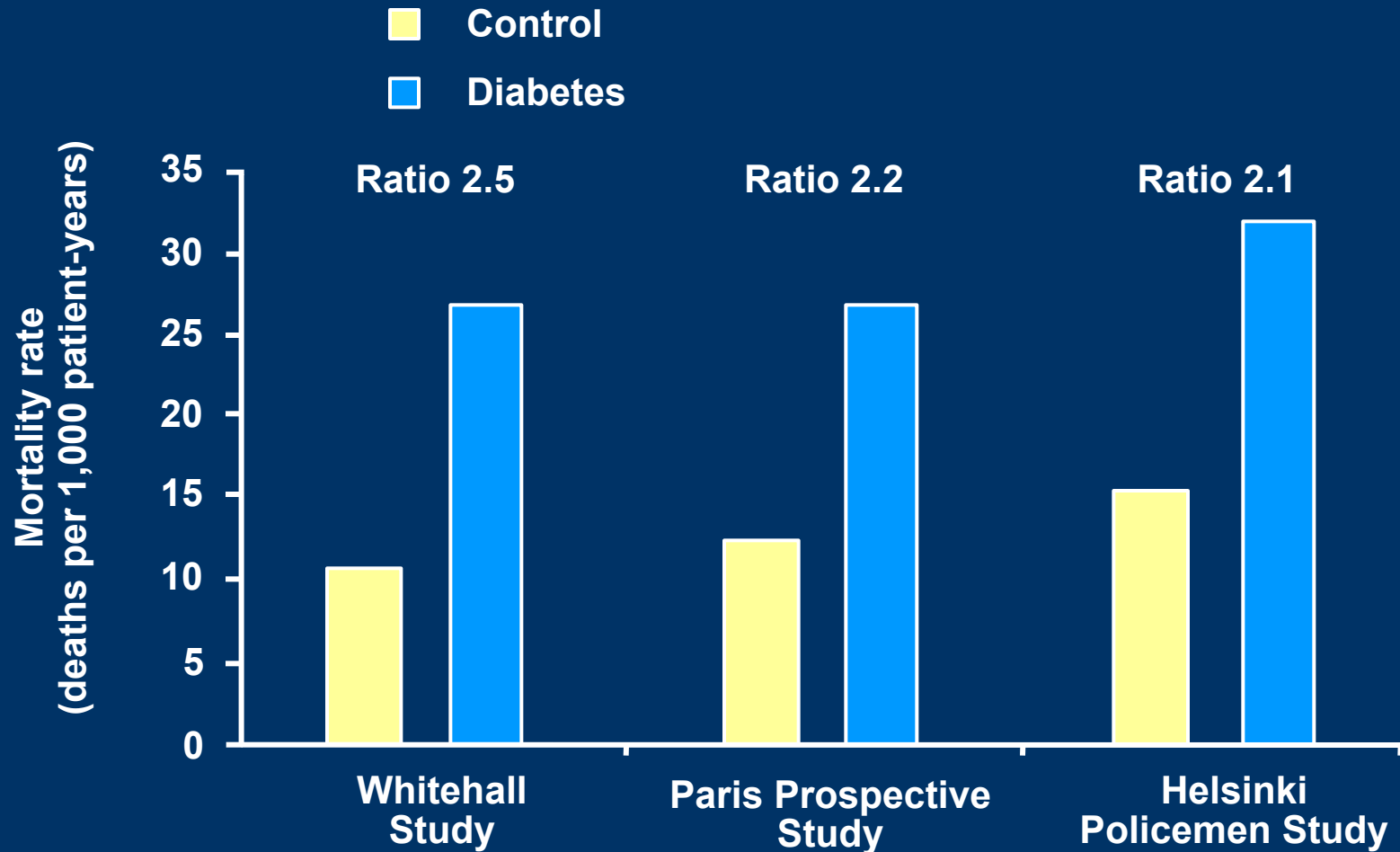
Data from England and Wales between 1981 and 2000 in men and women aged 35–84 years
There were 68,230 fewer CHD deaths than expected from baseline mortality rates in 1981

Individuals with diabetes are at increased risk of cardiovascular mortality



Age-adjusted relative risk of death compared with men with no diabetes or CHD

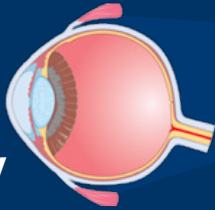
Mortality rate is doubled in individuals with diabetes



Type 2 diabetes is associated with serious complications

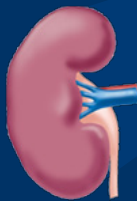
Diabetic Retinopathy

Leading cause of blindness in adults^{1,2}



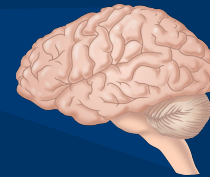
Diabetic Nephropathy

Leading cause of end-stage renal disease^{3,4}



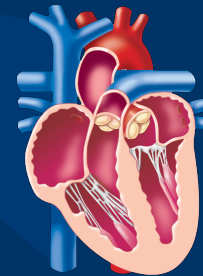
Stroke

2- to 4-fold increase in cardiovascular mortality and stroke⁵



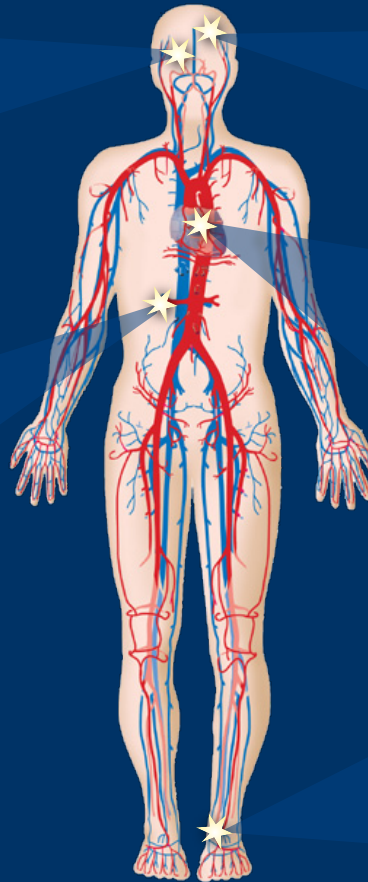
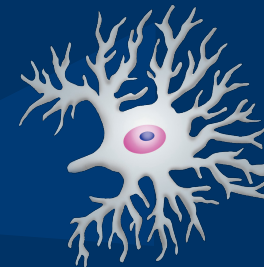
Cardiovascular Disease

8/10 individuals with diabetes die from CV events⁶



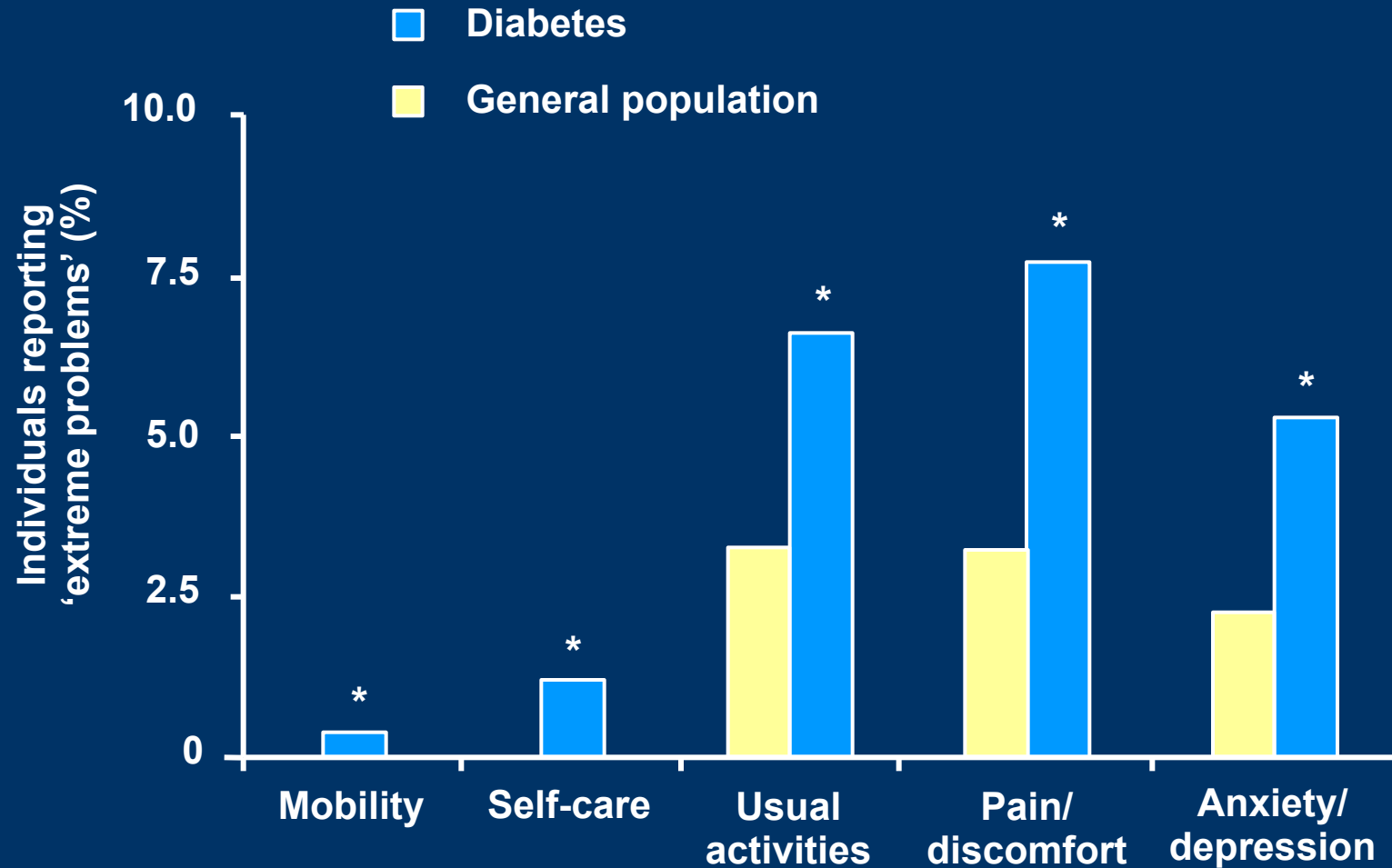
Diabetic Neuropathy

Leading cause of non-traumatic lower extremity amputations^{7,8}



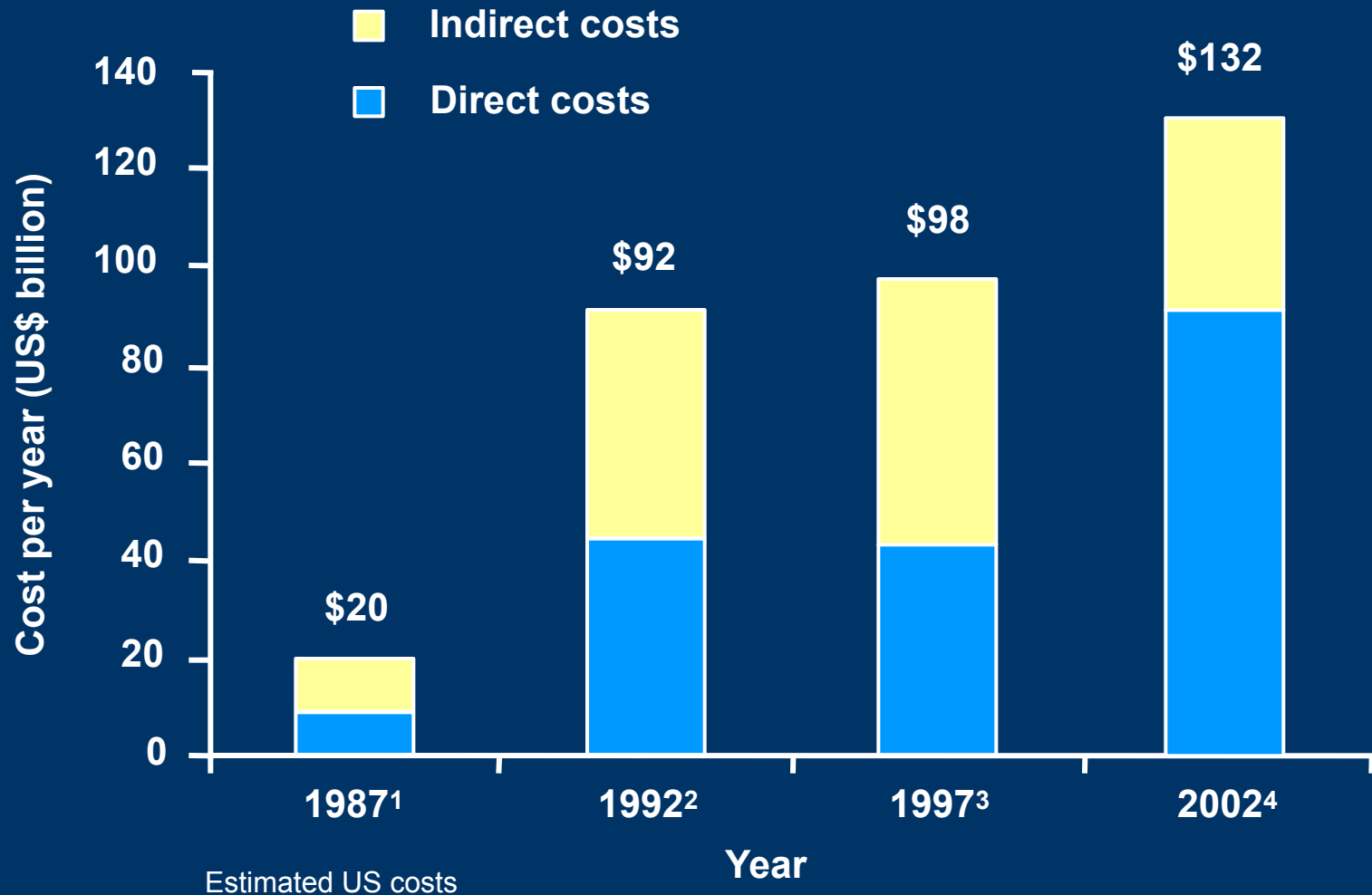
¹UK Prospective Diabetes Study Group. *Diabetes Res* 1990; 13:1–11. ²Fong DS, et al. *Diabetes Care* 2003; 26 (Suppl. 1):S99–S102. ³The Hypertension in Diabetes Study Group. *J Hypertens* 1993; 11:309–317. ⁴Molitch ME, et al. *Diabetes Care* 2003; 26 (Suppl. 1):S94–S98. ⁵Kannel WB, et al. *Am Heart J* 1990; 120:672–676. ⁶Gray RP & Yudkin JS. Cardiovascular disease in diabetes mellitus. In *Textbook of Diabetes* 2nd Edition, 1997. Blackwell Sciences. ⁷King's Fund. *Counting the cost. The real impact of non-insulin dependent diabetes*. London: British Diabetic Association, 1996. ⁸Mayfield JA, et al. *Diabetes Care* 2003; 26 (Suppl. 1):S78–S79.

Individuals suffering 'extreme problems' in quality of life



*Significant versus general population

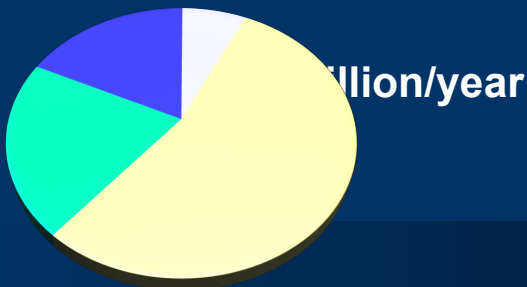
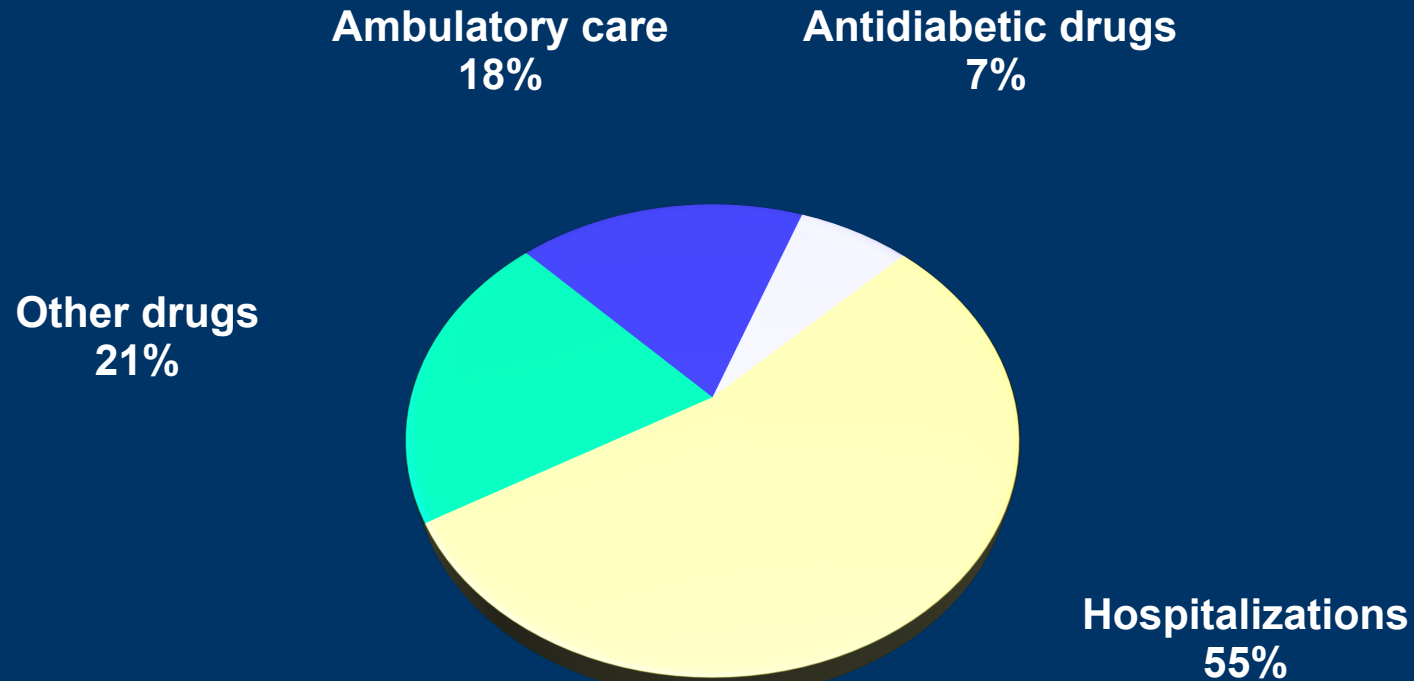
Costs of diabetes are rising



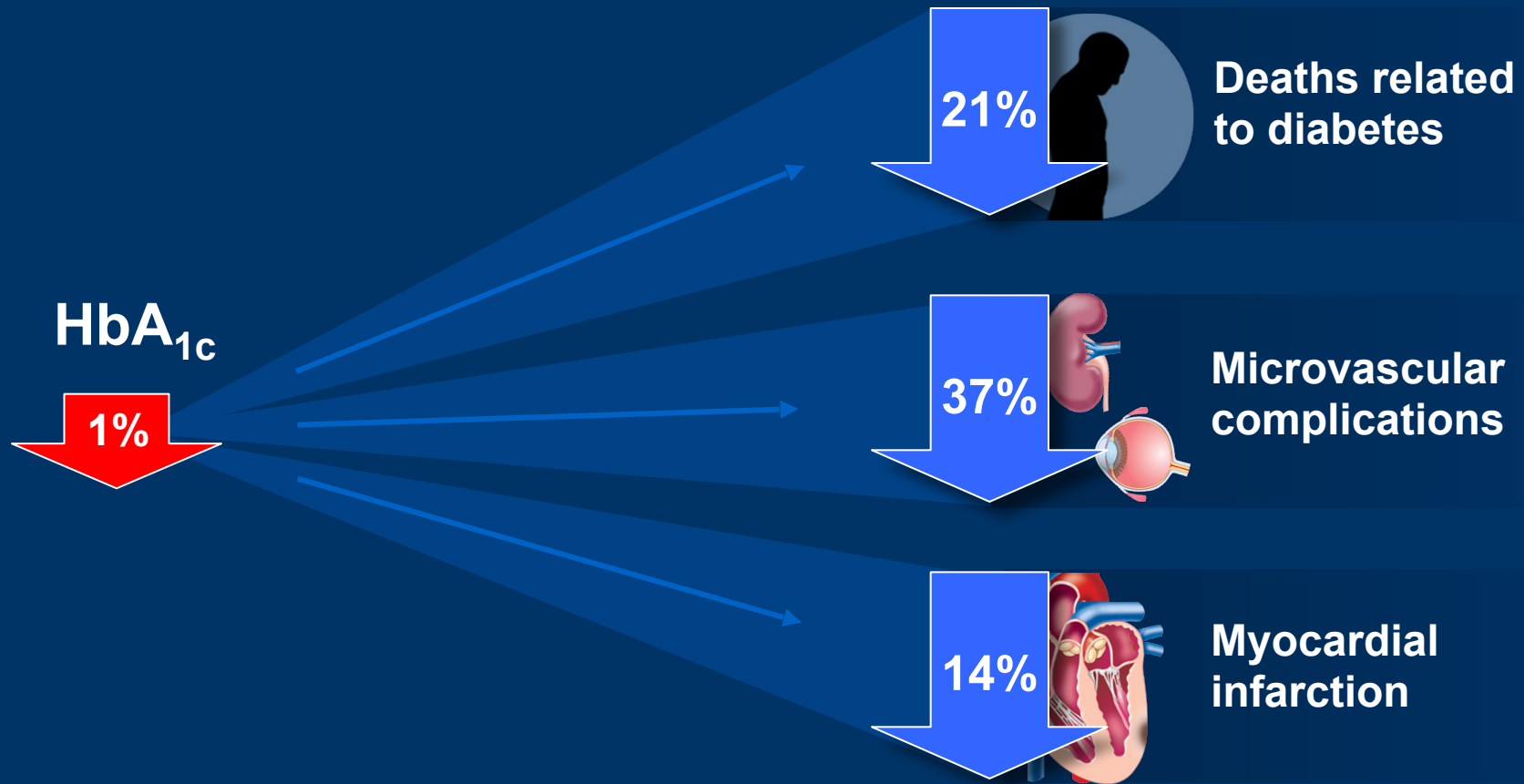
¹Huse DM, et al. *JAMA* 1989; 262:2708–2713. ²Javitt JC & Chiang Y-P. In *Diabetes in America*, 1995; 601–611. NIH Publication No. 95–1468.

³American Diabetes Association. *Diabetes Care* 1998; 21:296–309. ⁴American Diabetes Association. *Diabetes Care* 2003; 26:917–932.

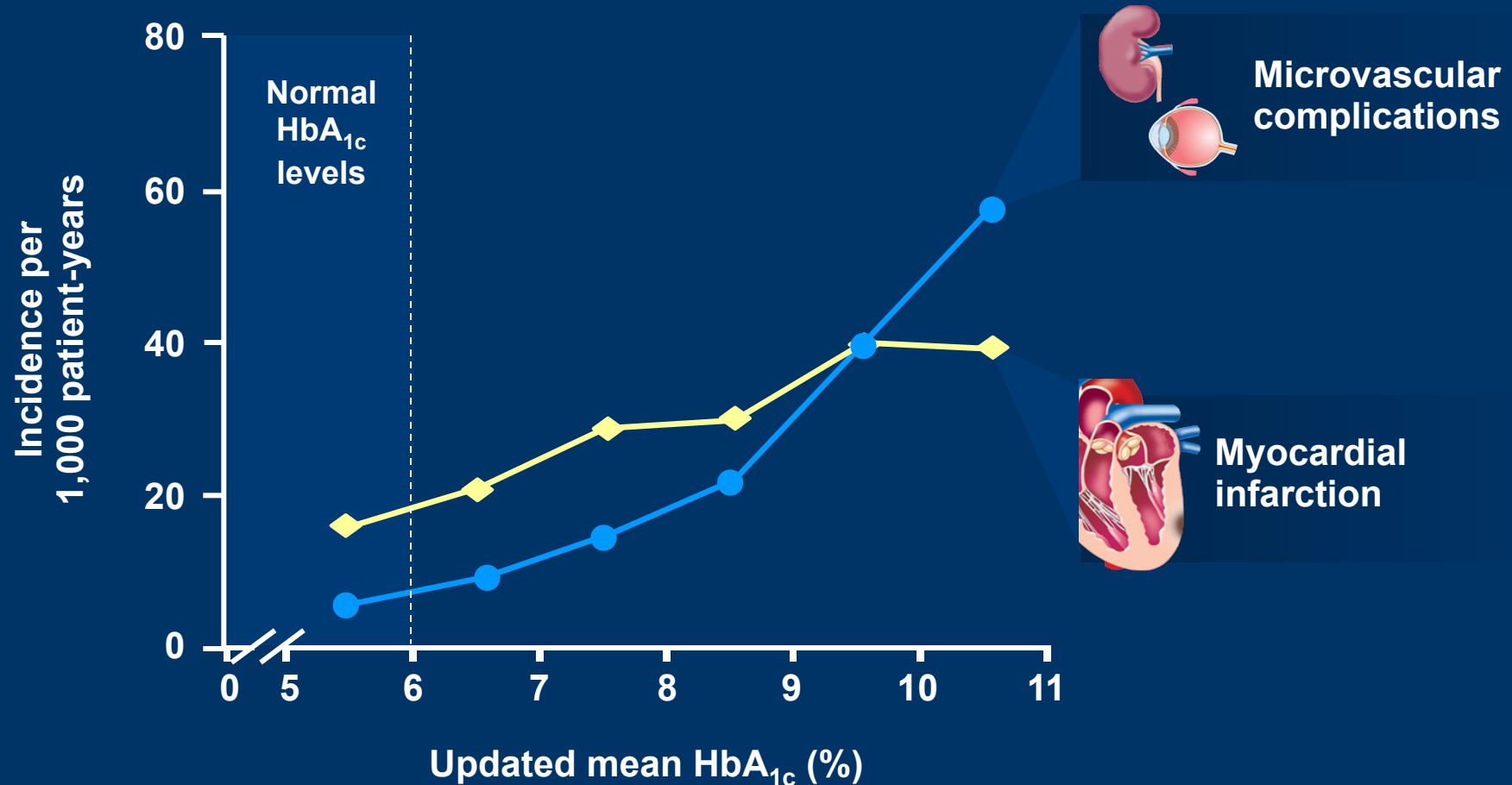
Hospitalizations account for the majority of the costs of managing type 2 diabetes



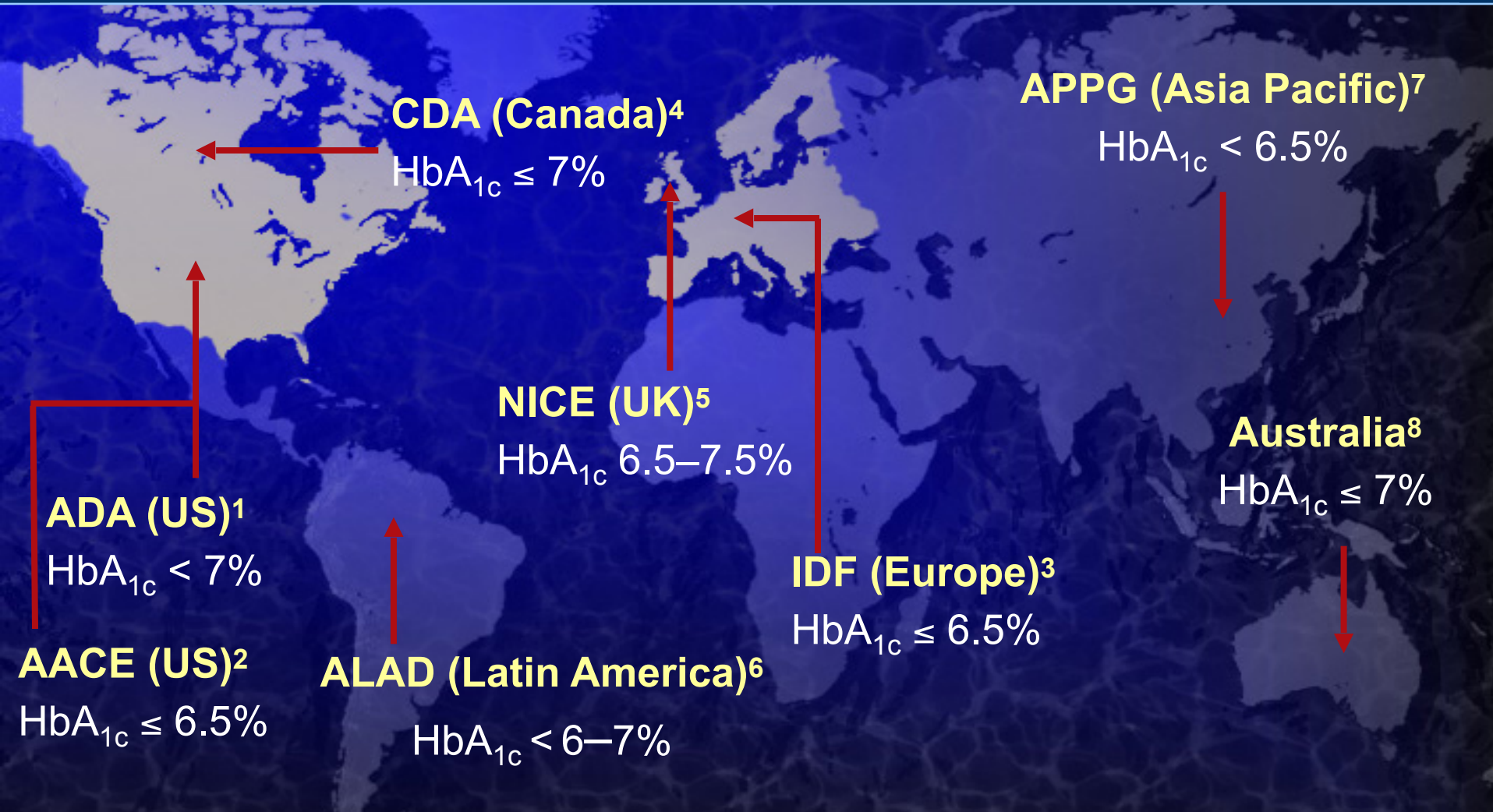
Lowering HbA_{1c} reduces the risk of complications



Risk of complications decreases as HbA_{1c} decreases



Diabetes management guidelines: HbA_{1c}



¹American Diabetes Association. *Diabetes Care* 2004; 27 (Suppl. 1):S15–S34. ²American Association of Clinical Endocrinologists. *Endocr Pract* 2002; 8 (Suppl. 1):40–82.

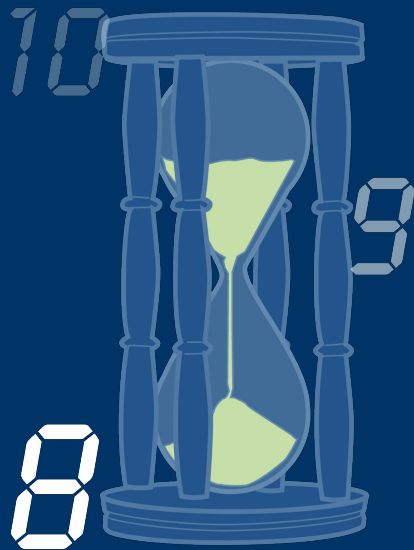
³European Diabetes Policy Group. *Diabet Med* 1999; 16:716–730. ⁴Canadian Diabetes Association. *Can J Diabetes* 2003; 27 (Suppl. 2):S1–S152.

⁵National Institute for Clinical Excellence. 2002. Available at: <http://www.nice.org.uk>. ⁶ALAD. *Rev Assoc Lat Diab* 2000; Suppl. 1.

⁷Asian-Pacific Policy Group. *Practical Targets and Treatments* (3rd Edition). ⁸NSW Health Department. 1996.

Diabetes management guidelines: a sense of urgency

HbA_{1c}



“... the results of the UKPDS mandate that treatment of type 2 diabetes include aggressive efforts to lower blood glucose levels as close to normal as possible”

American Diabetes Association¹

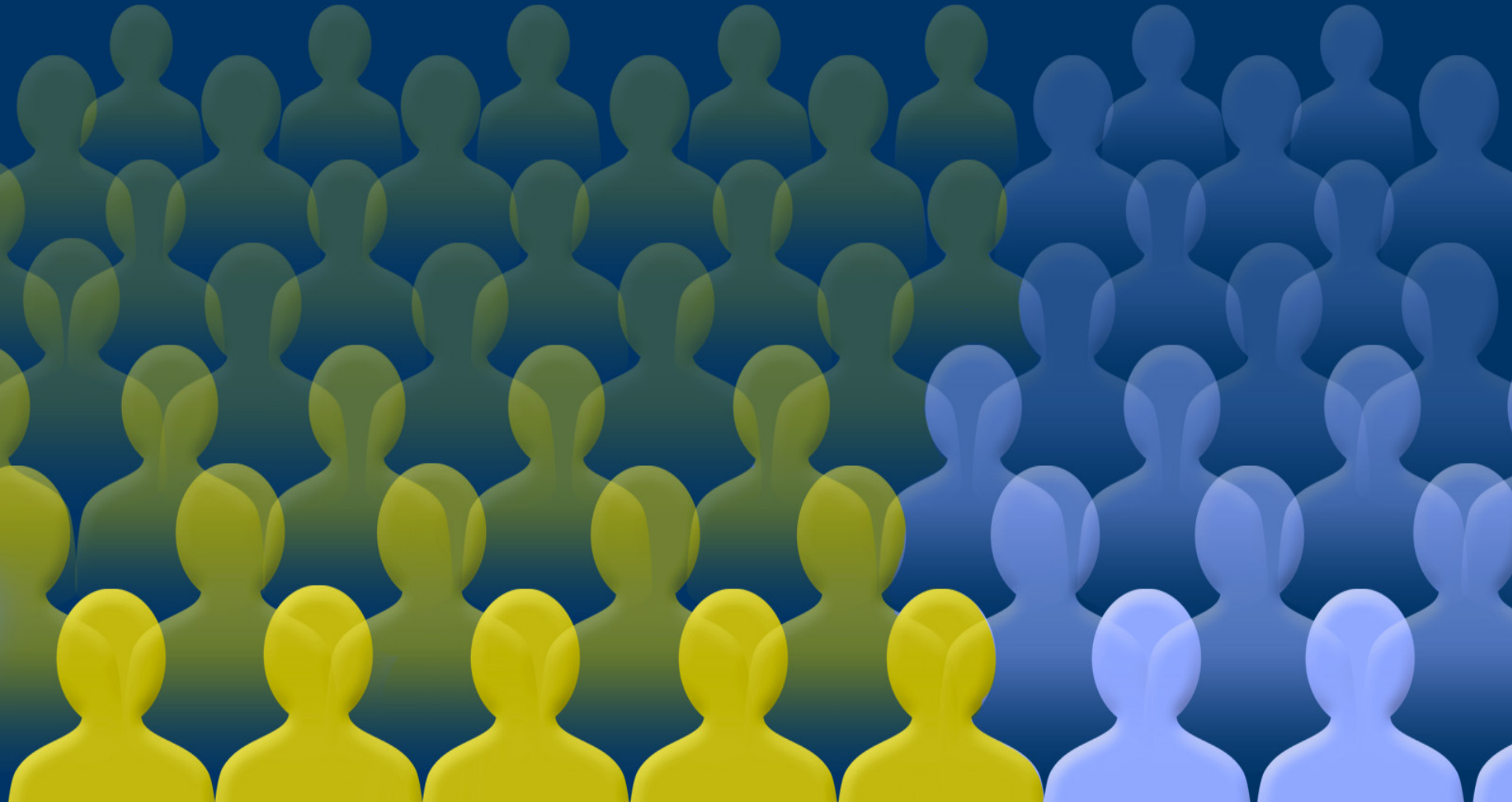
“Diabetes must be... diagnosed earlier. And once diagnosed, all types of diabetes must then be managed much more aggressively”

Canadian Diabetes Association²

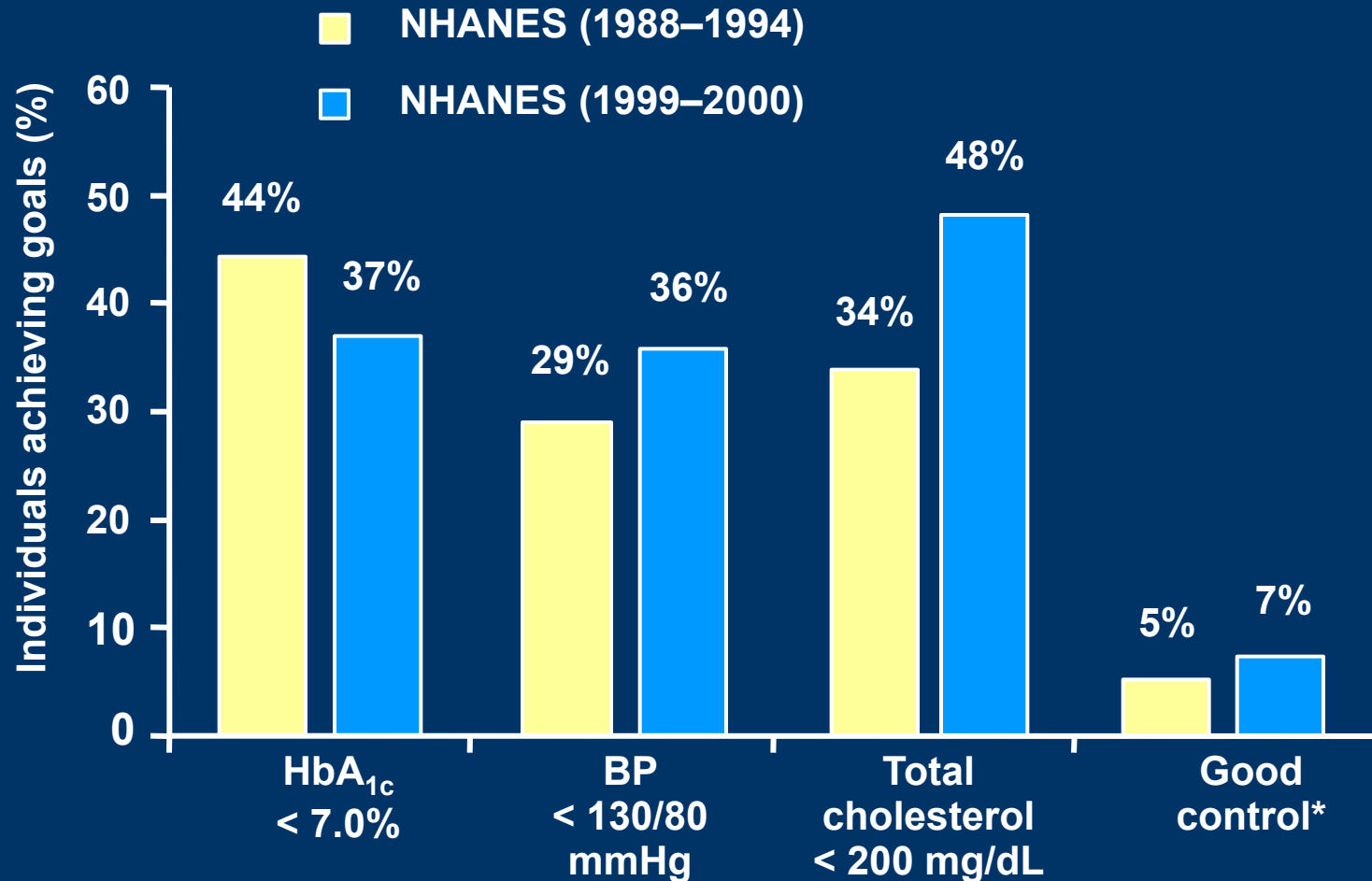
¹American Diabetes Association. *Diabetes Care* 2003; 26:S28–S32.

²Canadian Diabetes Association. *Can J Diabetes* 2003; 27 (Suppl. 2):S1–S152.

Two thirds of individuals do not achieve target HbA_{1c}



Proportion of individuals reaching target HbA_{1c} is not improving over time

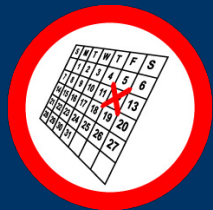


*Individuals achieving goals for HbA_{1c}, blood pressure and total cholesterol

Barriers to achieving good glycemic control



Lack of clarity over definition of good glycemic control



Inadequate monitoring of glycemia



Complexity of managing hyperglycemia relative to dyslipidemia and hypertension



Insufficient involvement of specialist care units



HbA_{1c}

Lack of clarity over definition of
good glycemic control

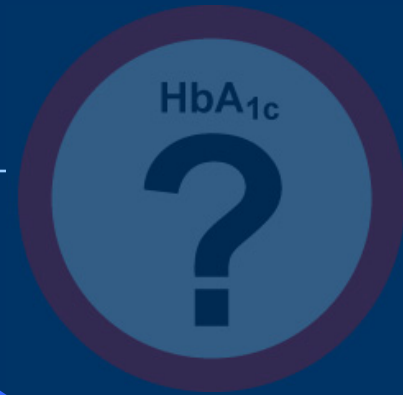
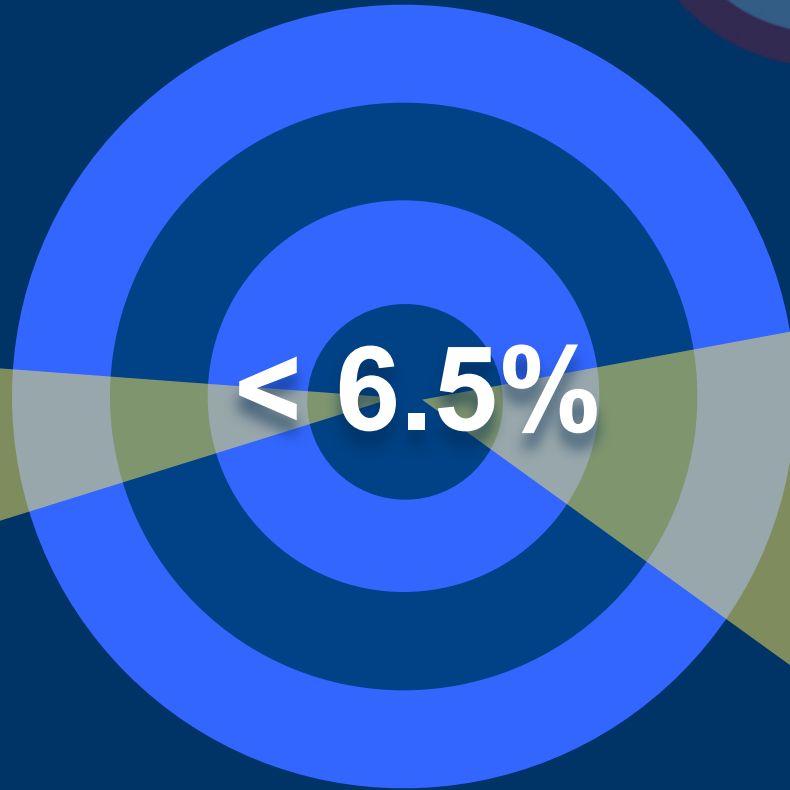
Although HbA_{1c} targets are converging, good glycemic control is not reached



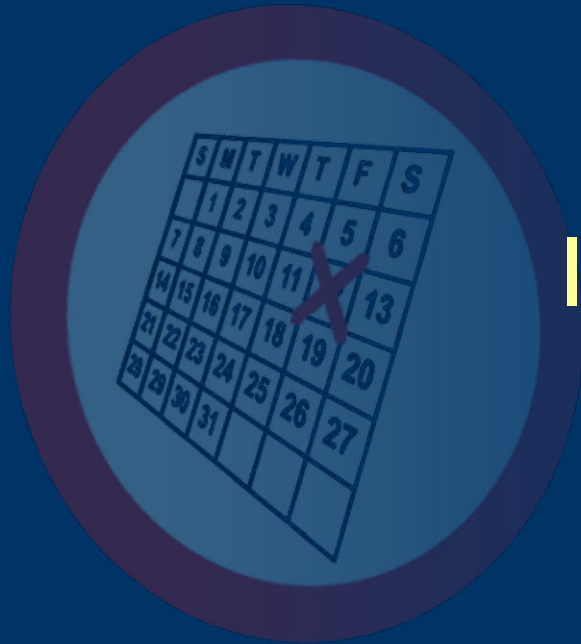
What is good glycemic control?

The Global Partnership recommends:

Aim for good glycemic control = $\text{HbA}_{1c} < 6.5\%^*$



*Or fasting/preprandial plasma glucose < 110 mg/dL (6.0 mmol/L) where assessment of HbA_{1c} is not possible



Inadequate monitoring of glycemia

Frequent monitoring of glycemia is important

- Cornerstone of diabetes care
- Ensures best possible glycemic control by:
 - assessing efficacy of therapy
 - guiding adjustments in diabetes care regimen, including diet, exercise and medications



Who should monitor glycemia?



Patient
Self-monitoring
of blood glucose



Healthcare professionals
Regular monitoring of HbA_{1c}

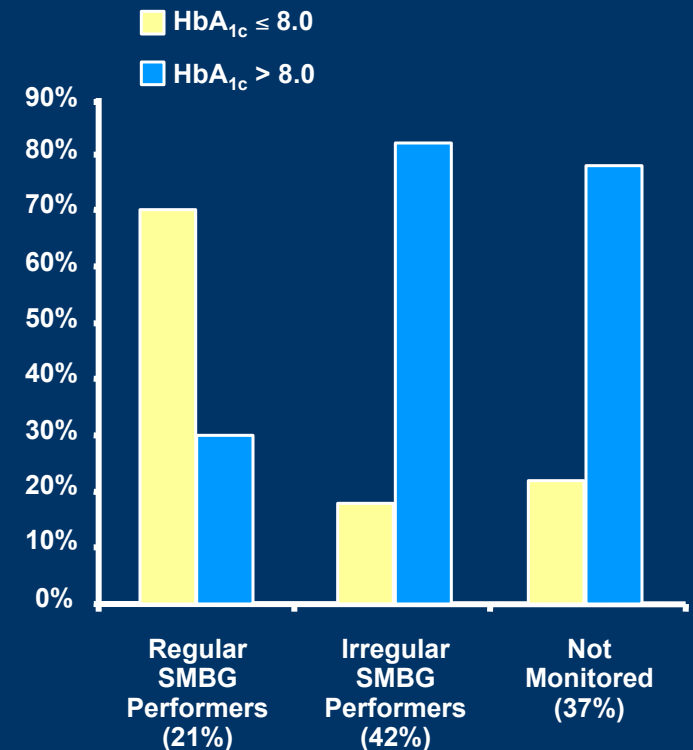
Diabetes care team

Combined synergistic efforts of
team are crucial to ensure effective
monitoring of glycemic control



Self-monitoring of blood glucose (SMBG)

- Regular SMBG increases the proportion of individuals achieving their glycemic targets
- Individuals should monitor postprandial glucose as part of their SMBG schedule
- Regular discussion of results with diabetes care team is essential

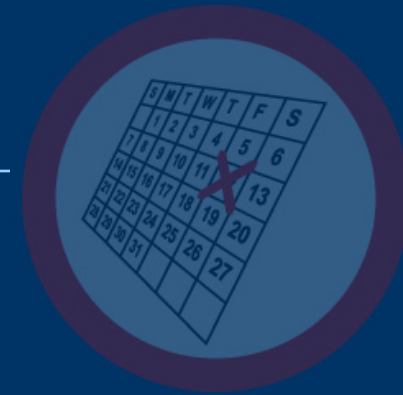


HbA_{1c} monitoring

- HbA_{1c} measures glycemia over preceding 2–3 months
- Regular assessment of HbA_{1c} can lead to more proactive management of diabetes
- Two consecutive measurements of HbA_{1c} $\geq 7.0\%$ should lead to a review of the treatment algorithm

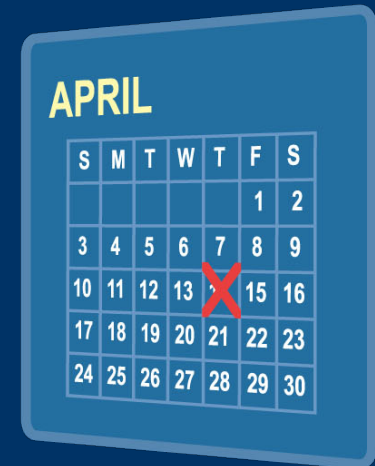
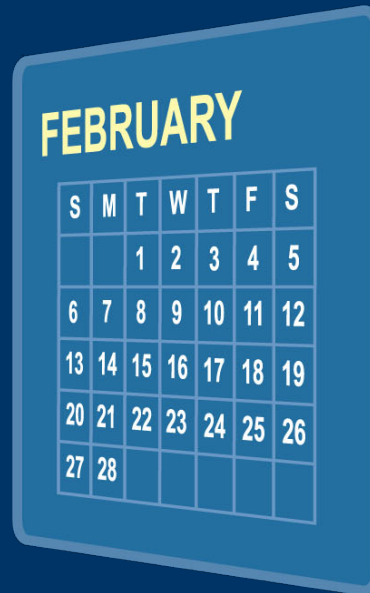
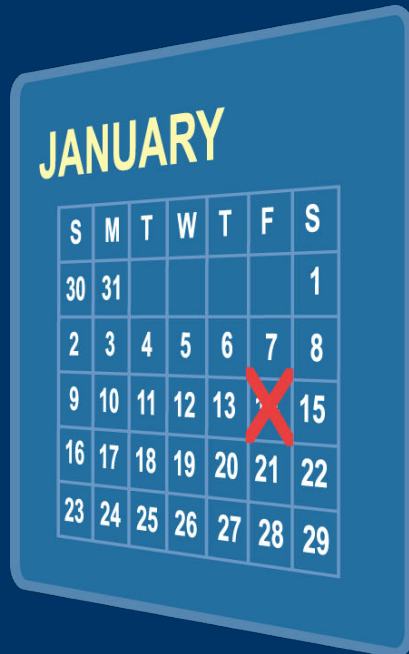



How often should HbA_{1c} be monitored?



The Global Partnership recommends:

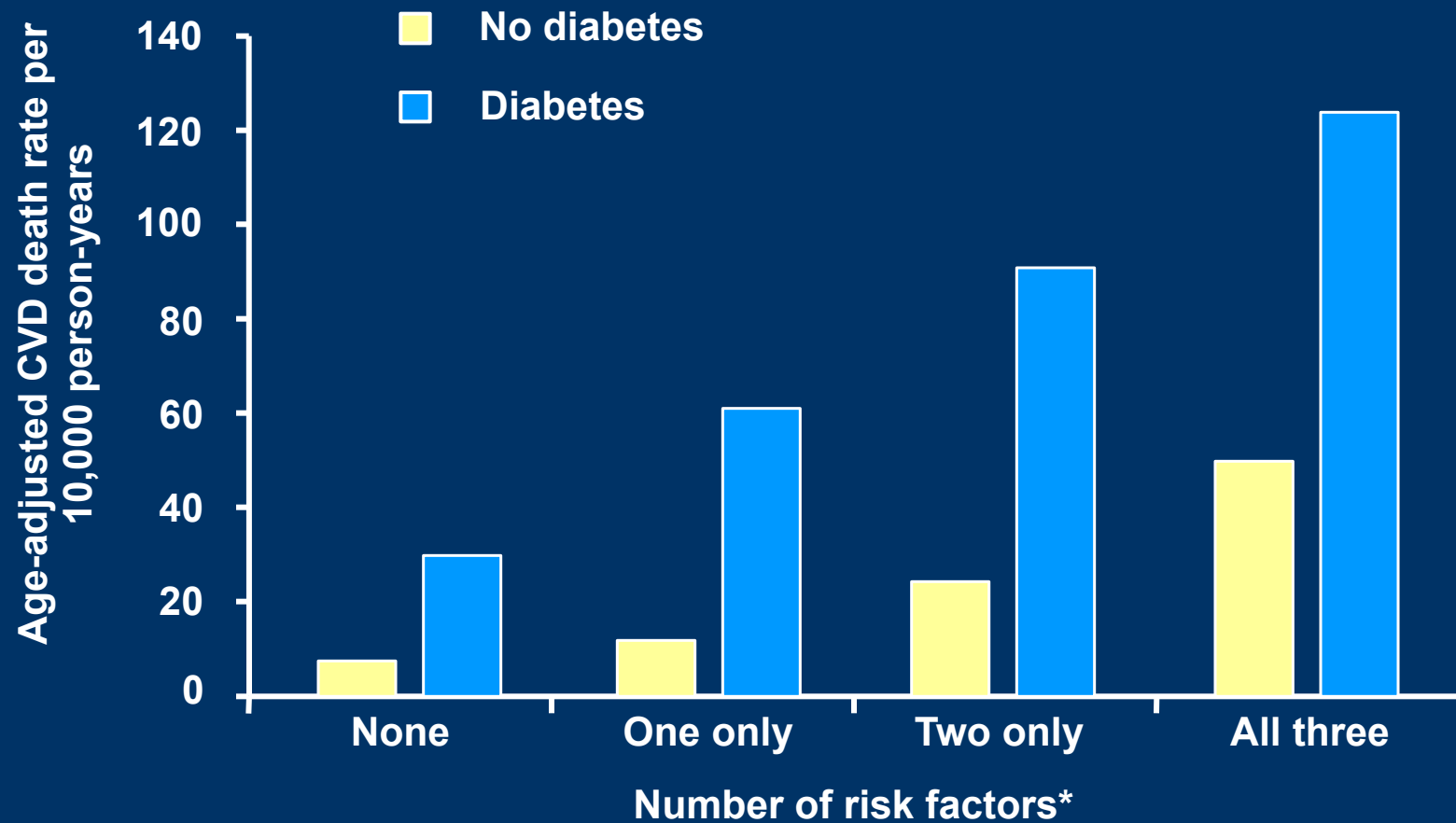
Monitor HbA_{1c} every 3 months in addition to regular glucose self-monitoring





Complexity of managing hyperglycemia
relative to dyslipidemia and hypertension

Influence of multiple risk factors and diabetes on CVD mortality



*Serum cholesterol > 200 mg/dL, smoking, systolic blood pressure > 120 mmHg

What are the priorities in diabetes management?

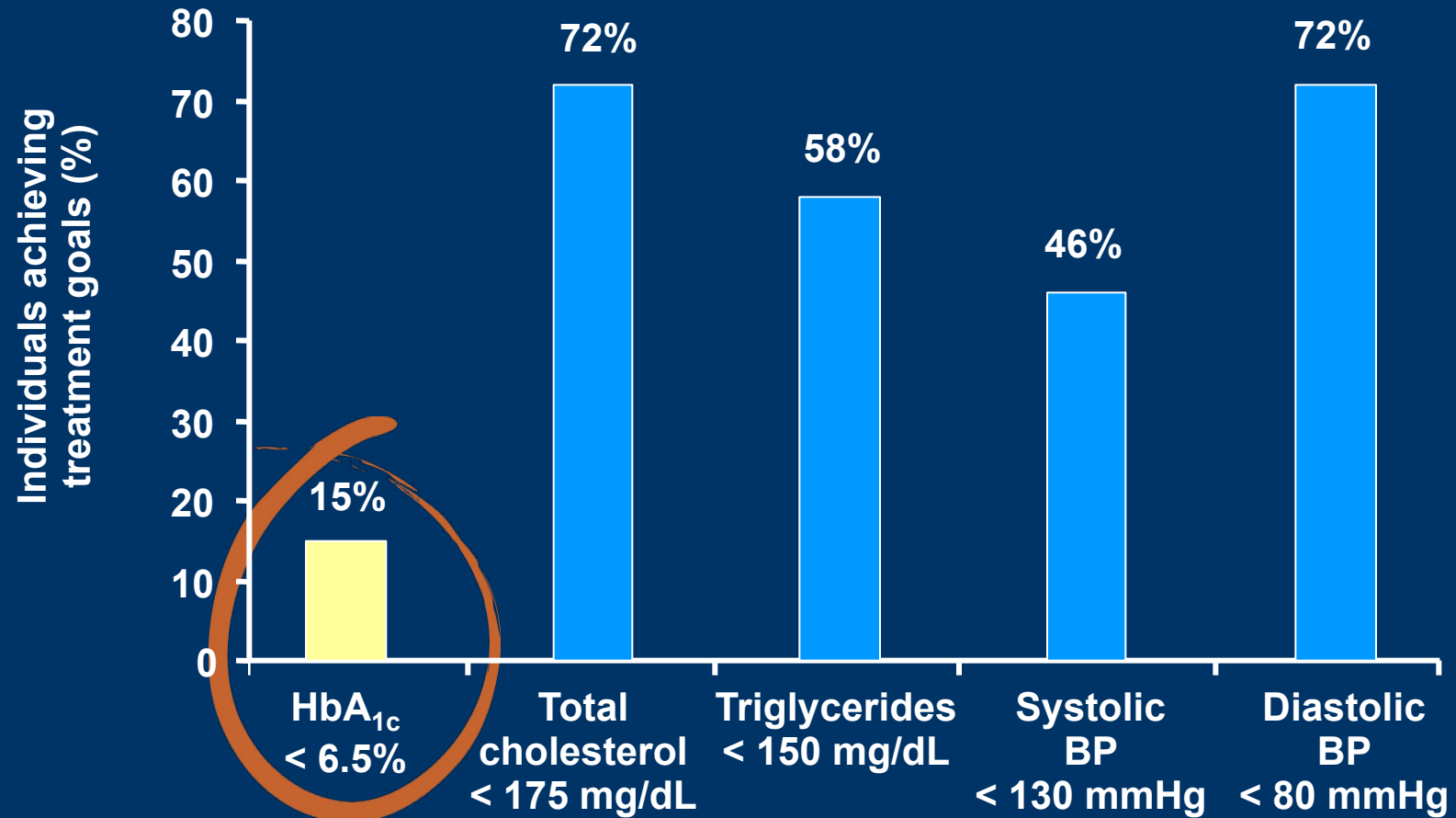
Cholesterol?

Glucose?

**Blood
pressure?**



Fewer individuals achieve goals for HbA_{1c} versus lipids and blood pressure



Should glycemia be given more or less priority versus lipids and blood pressure?

The Global Partnership recommends:

Aggressively manage hyperglycemia, dyslipidemia and hypertension with the same intensity to obtain the best patient outcome



Glycemic control = Lipid-lowering = Antihypertensive

FPG
HbA_{1c}

TC *TGs*
HDL *LDL*

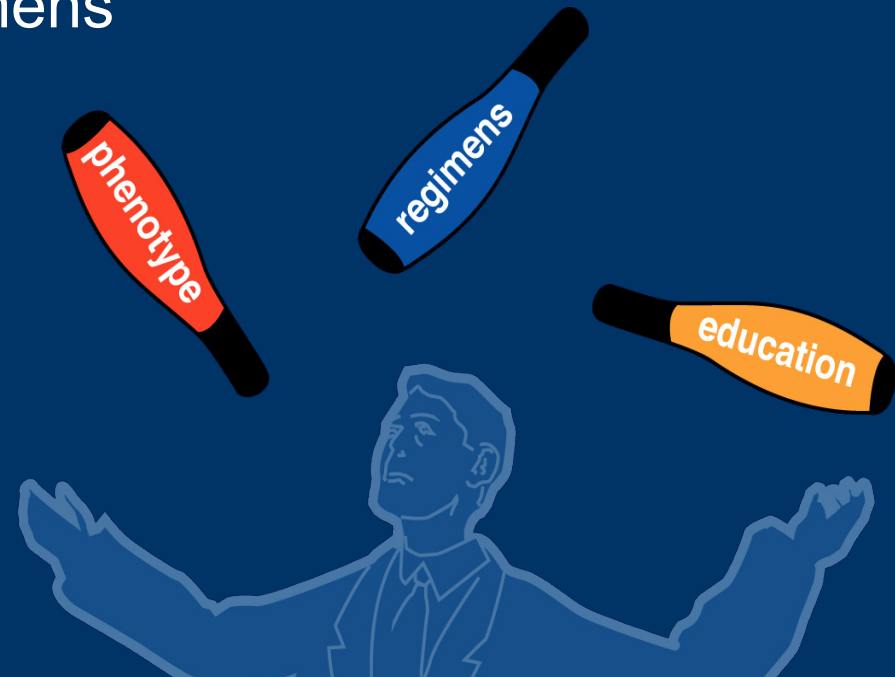
SBP *DBP*
ABPM



Insufficient involvement of
specialist care units

Type 2 diabetes is a complex disorder

- Management of type 2 diabetes needs considerable expertise in order to:
 - match medication to individual ‘phenotype’
 - manage complex drug regimens
 - provide strong support for patient education



Specialist input leads to better outcomes in type 2 diabetes

17%



In the Verona Diabetes Study, individuals attending a specialist diabetes center had a substantially improved chance of survival compared with those seen only by family physicians

How can expertise be best utilized in diabetes management?

The Global Partnership recommends:

Refer all newly diagnosed patients to a unit specializing in diabetes care *where possible*

