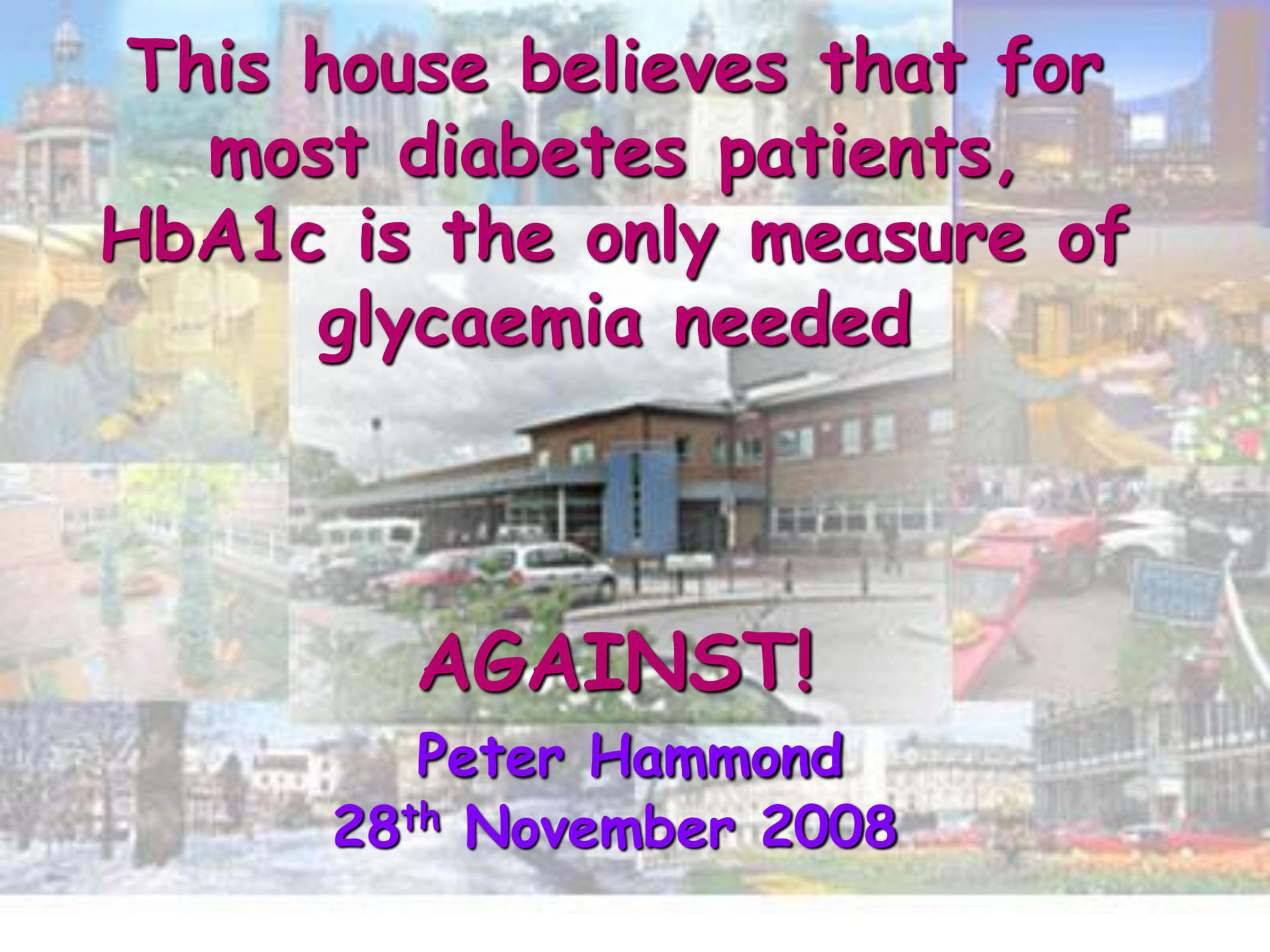


This house believes that for most diabetes patients, HbA1c is the only measure of glycaemia needed

AGAINST!

Peter Hammond

28th November 2008

Glucose sensing

Advancing technology

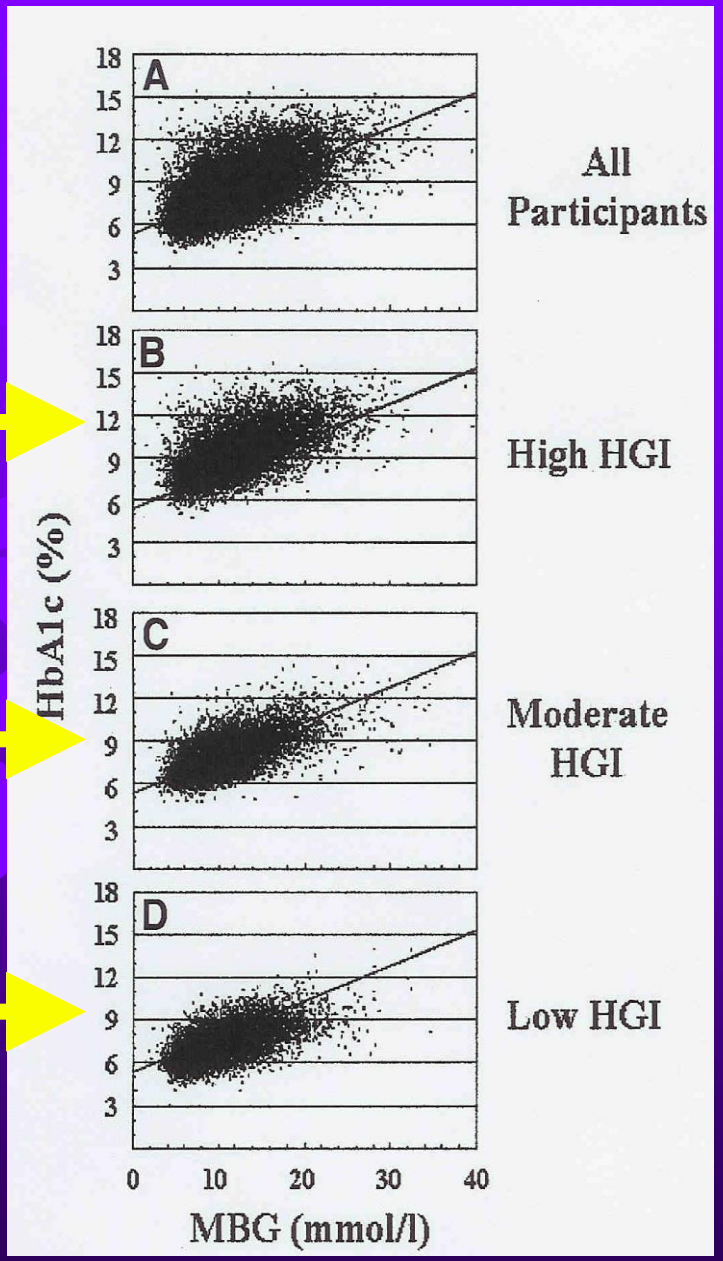
Insulin delivery	Glucose sensing	Increasing:
MDI	SMBG	Technophile
Basic CSII	CGM – blind	Advanced diabetes education
Expert CSII	CGM – real time	
Sensor-enhanced CSII Closed-loop system		Complex lifestyle and needs

Deficiencies of HbA1c as measure of glycaemic control

High HbA_{1c} for MBG

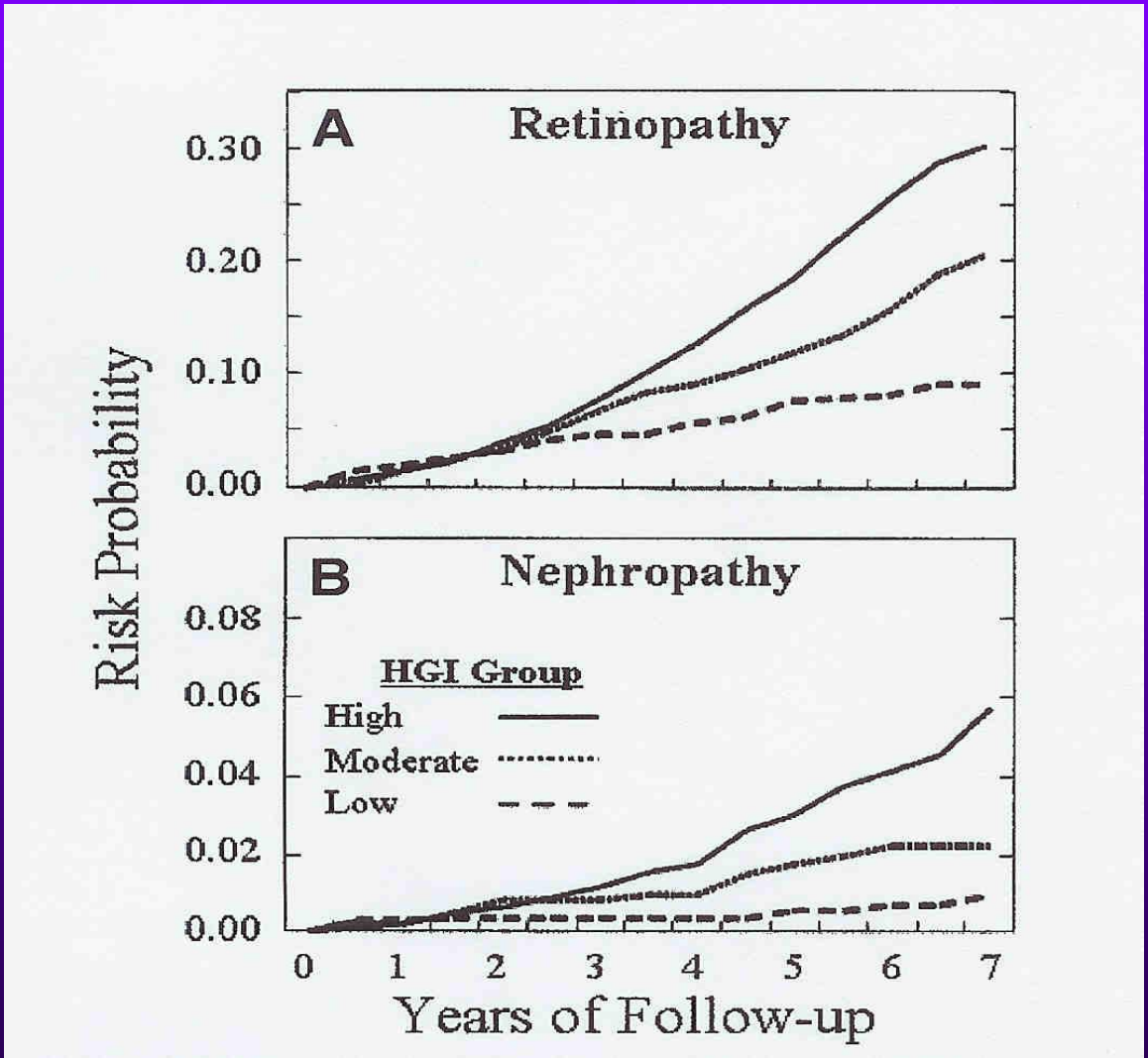
Medium HbA_{1c} for MBG

Low HbA_{1c} for MBG



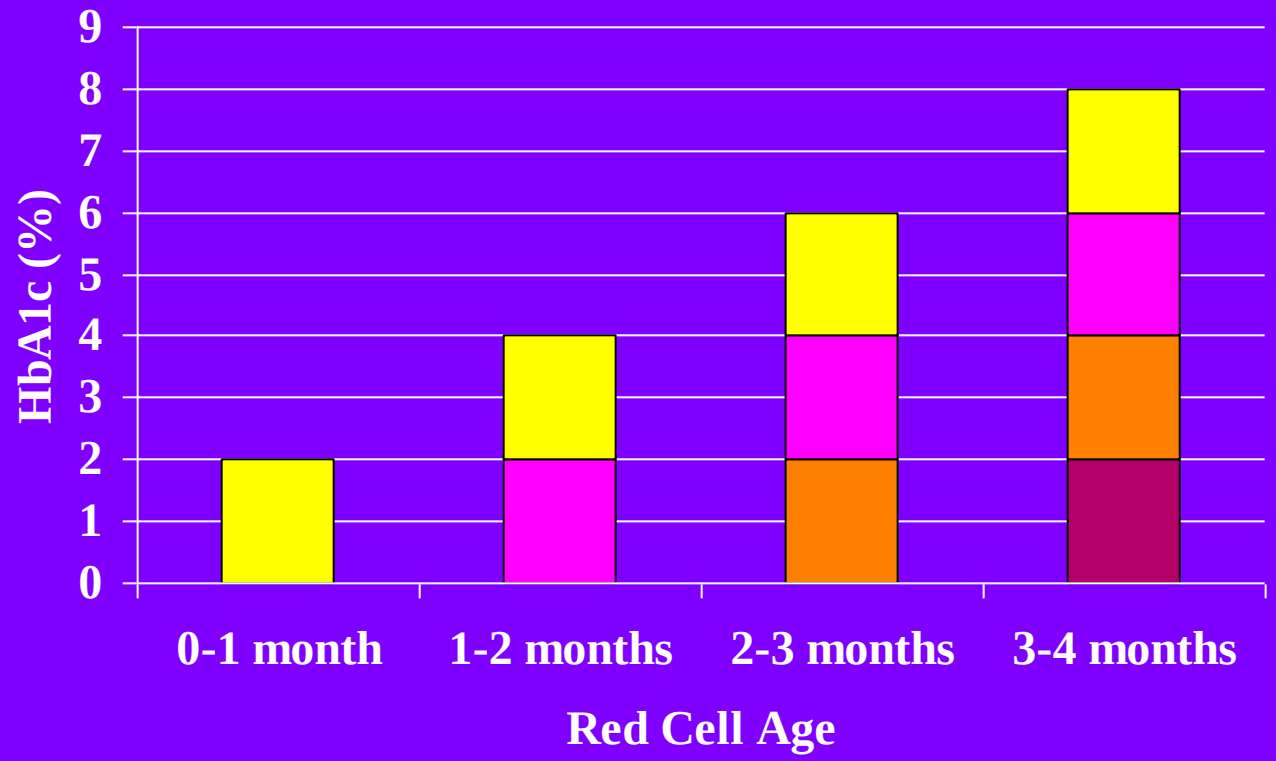
Mc Carter RJ et al. Diabetes Care 2004;**27:**1259-64

HGI and Risk of Complications



Mc Carter RJ et al. Diabetes Care 2004;**27:**1259-64

Model of Glycated Haemoglobin Formation



HbA1c measurement

- Not standardised
- Reasonable measure of glycaemic control in populations
- Good marker of risk microvascular complications
- Inconsistent of **individual's** control
- Inappropriate reliance on HbA_{1c} results can lead to imperfect assessment of the quality of disease management

Why not use SMBG?

Are you interested in populations or individuals?

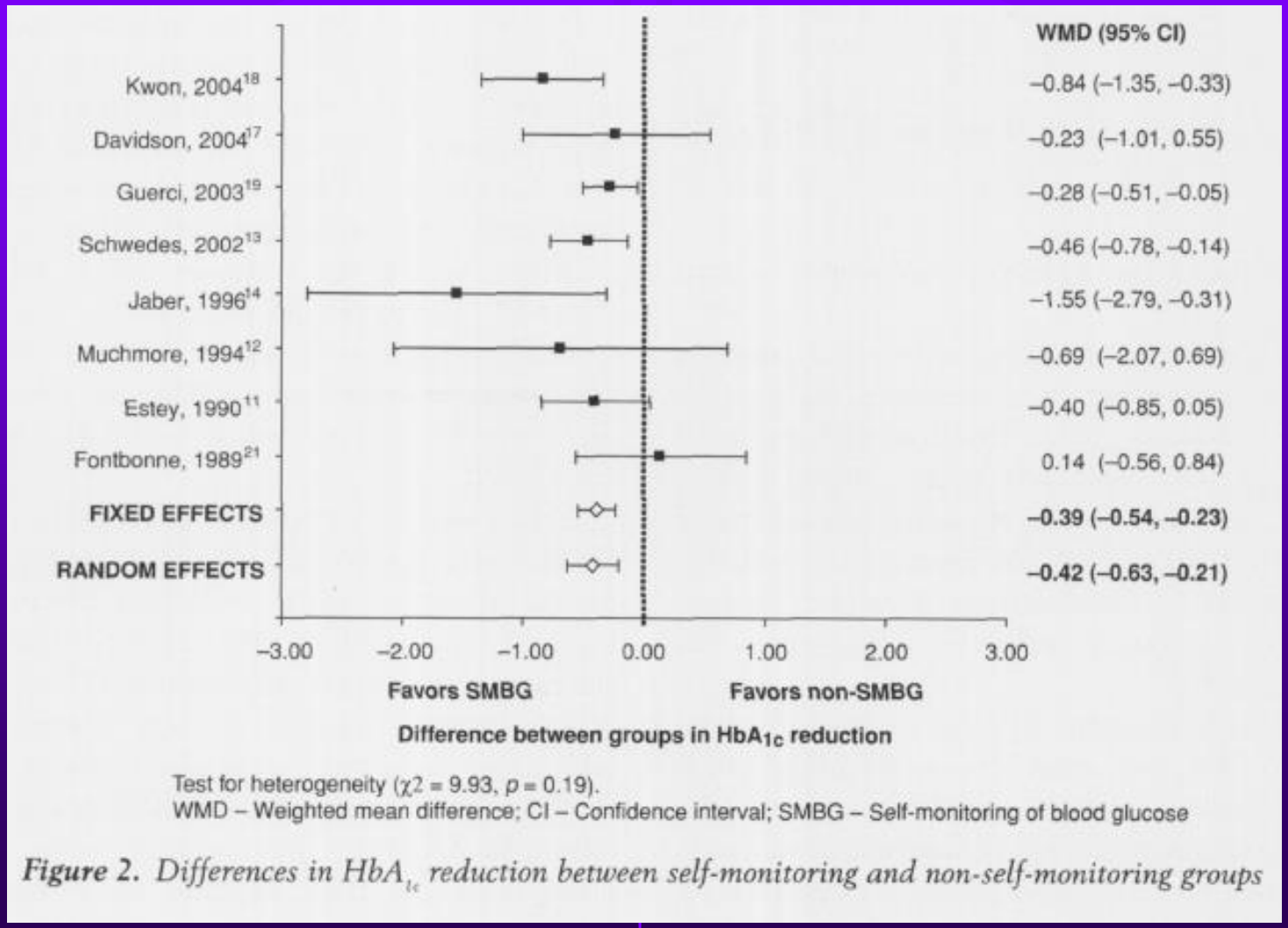
What about non-insulin treated type 2 diabetes?

Why not use SMBG in NIT-DM2?

- Doesn't impact on HbA1c

Does SMBG affect HbA1c in NIT-DM?

Pick the meta-analysis to suit your argument!



Test for heterogeneity ($\chi 2 = 9.93$, $p = 0.19$).
WMD – Weighted mean difference; CI – Confidence interval; SMBG – Self-monitoring of blood glucose

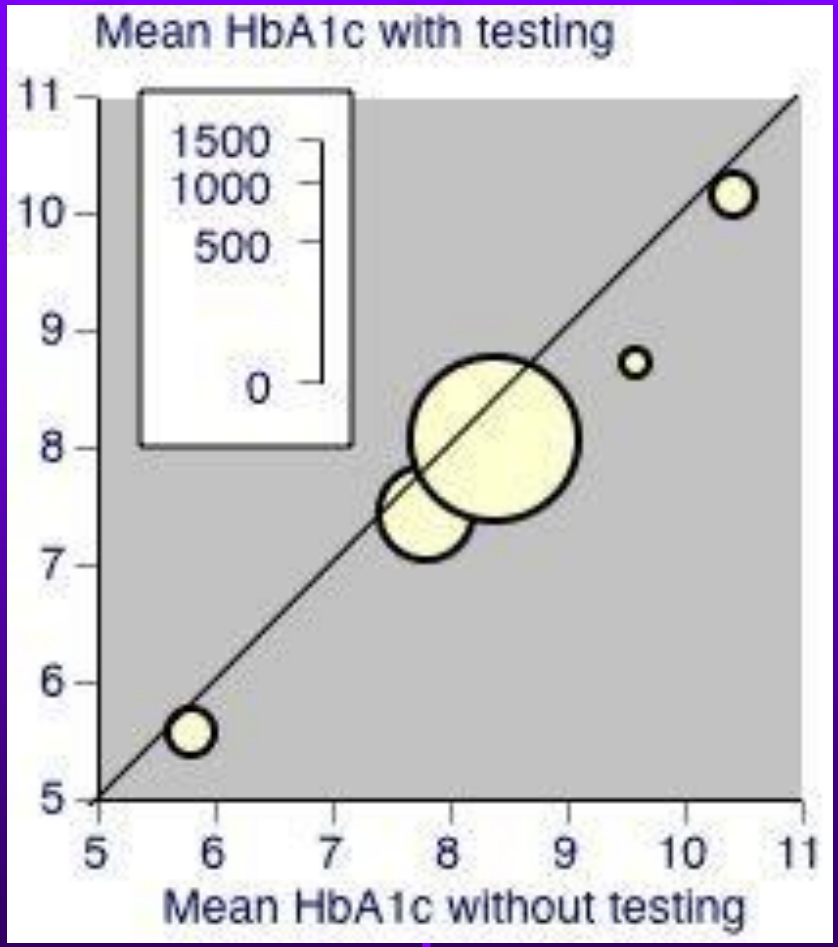
Figure 2. Differences in HbA_{1c} reduction between self-monitoring and non-self-monitoring groups

Sarol JN et al. Current Med Res Opin 2005;21:173-183.

Cochrane Review

- 4 RCTs – no difference over control/SMUG – study populations 54, 88, 208, 23
- Guerci et al. – 689 individuals
  - Control HbA1c – 0.5%
  - SMBG HbA1c – 0.9%
  - NNT 10 for improved control
- Schwedes et al. – 223 individuals
  - Control HbA1c – 0.5%
  - SMBG HbA1c – 1.0%

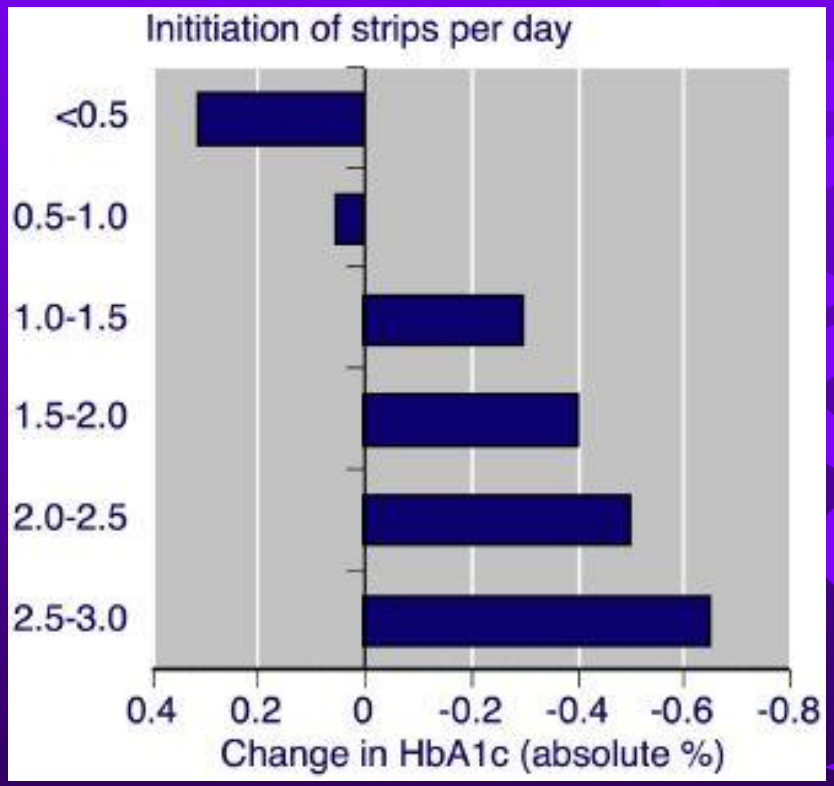
Further meta-analysis



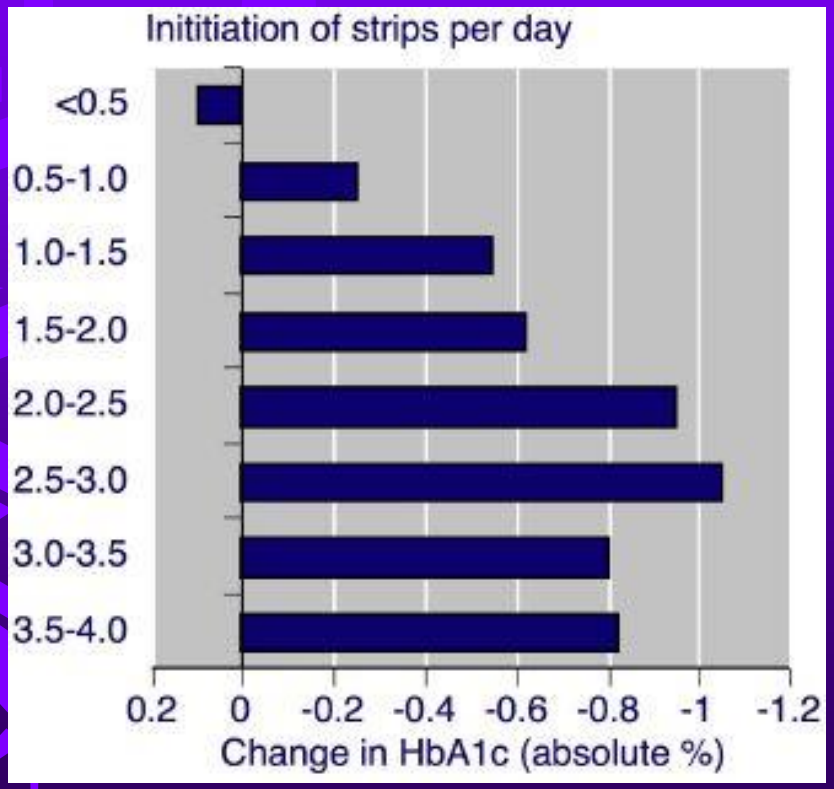
http://www.jr2.ox.ac.uk/bandolier/band134/b134-2.html

Impact of strip usage

No medication



Oral agents

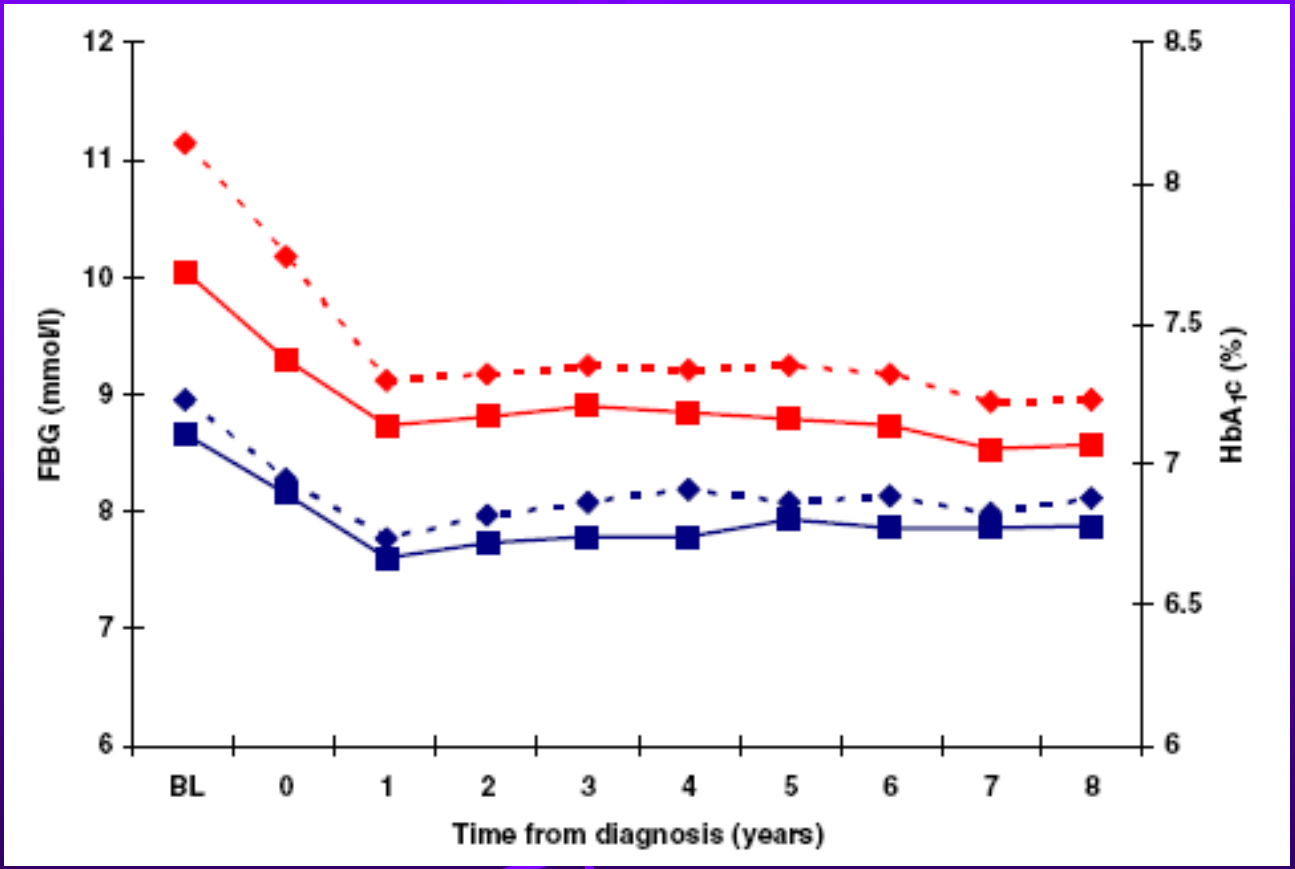


Karter AJ et al. Diabetes Care 2006;**29:**1757-63

Why not use SMBG in NIT-DM2?

- Doesn't impact on HbA1c
- Doesn't impact on clinical outcomes

Is HbA1c that important?



Martin S et al.Diabetologia 2006;49:271-278.

Clinical Outcomes with SMBG

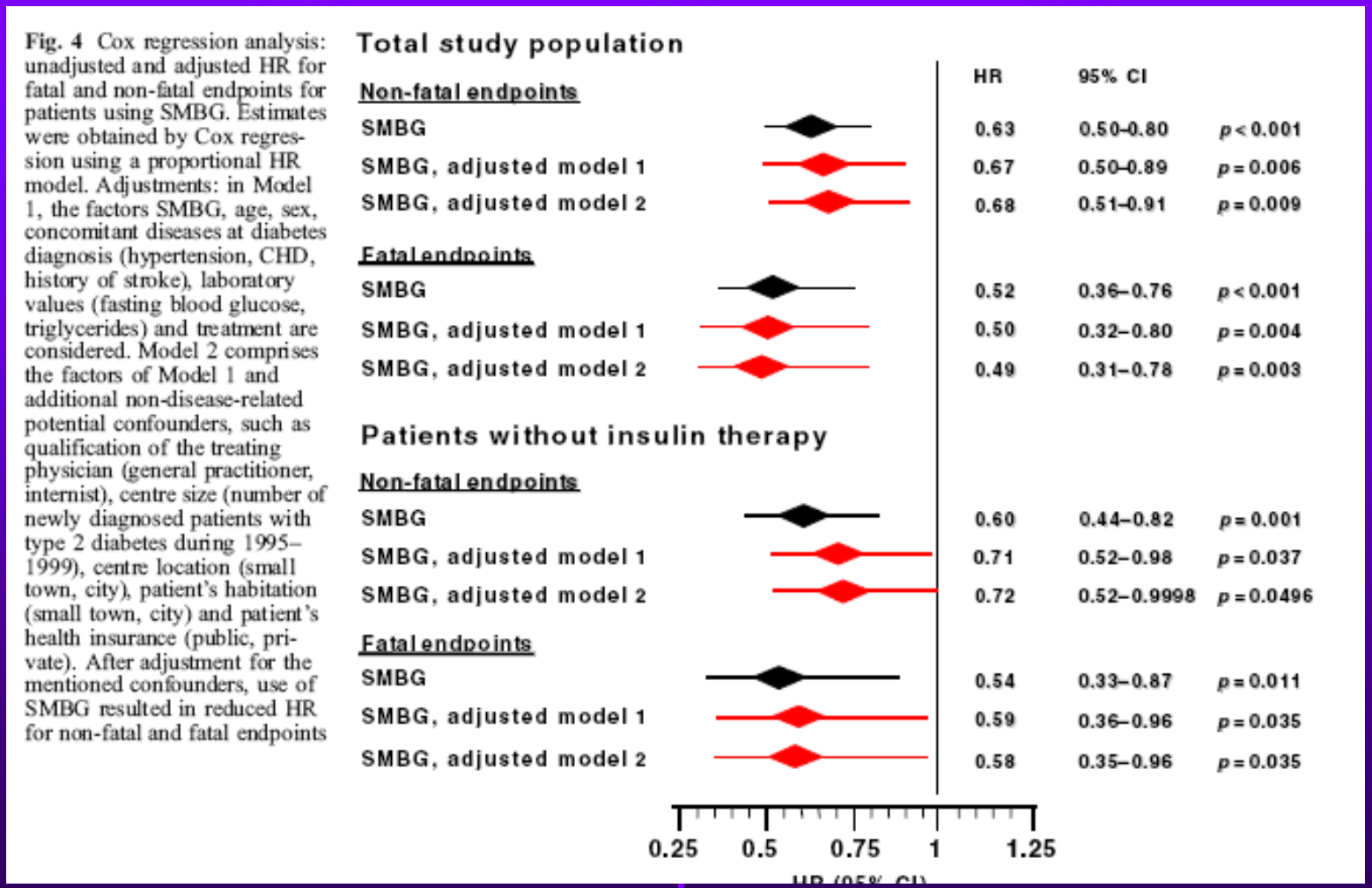


Fig. 4 Cox regression analysis: unadjusted and adjusted HR for fatal and non-fatal endpoints for patients using SMBG. Estimates were obtained by Cox regression using a proportional HR model. Adjustments: in Model 1, the factors SMBG, age, sex, concomitant diseases at diabetes diagnosis (hypertension, CHD, history of stroke), laboratory values (fasting blood glucose, triglycerides) and treatment are considered. Model 2 comprises the factors of Model 1 and additional non-disease-related potential confounders, such as qualification of the treating physician (general practitioner, internist), centre size (number of newly diagnosed patients with type 2 diabetes during 1995–1999), centre location (small town, city), patient's habitation (small town, city) and patient's health insurance (public, private). After adjustment for the mentioned confounders, use of SMBG resulted in reduced HR for non-fatal and fatal endpoints

Martin S et al.Diabetologia 2006;49:271-278.


SMBG

Why not use SMBG in NIT-DM2?

- Doesn't impact on HbA1c
- Doesn't impact on clinical outcomes
- Increases patient anxiety
  - because not given the wherewithal to make changes according to the information obtained

ESMON study

- 184 newly diagnosed type 2
- HbA1c
  - Control: 8.6% to 6.9%
  - SMBG: 8.8% to 6.9%
- 1/3 SMBG group failed to test appropriately
- Higher scores on depression scale (6% increase) – but not on any other QoL measures
- Depression may reflect the reality of confronting chronic disease

O'Kane et al.BMJ 2008;336:1174.

Patient perspective

- Patients tend not to act on BG due to lack of education about appropriate response
- Perceive BG as a proxy measure of good and bad behaviour
- HCPs should be explicit about whether and when patients should self-monitor and how to interpret and act on results

Peel et al.BMJ 2007;335:493.

Does more directed SMBG improve outcomes?

Meta-analysis

- Overall SMBG results in HbA1c reduction of 0.4%
- SMBG with feedback doubles HbA1c reduction

Jansen JP et al. Current Med Res Opin 2006;22:671.

DIGEM study: costs

	Less intensive SMBG	More intensive SMBG
Self-monitoring	+ £86	+ £79
Nurse visits	+£6	+£5
Drugs	+£9.40	-£20.00

Simon et al. BMJ 2008;336:1177.

Cost-effectiveness

Kaiser Permanente modelling

- HbA1c decrease according to frequency SMBG
  - x1/d 0.32%
  - x2/d 0.77%
  - x3/d 1.02%
- Cost per QALY over 10 years $518

Tunis SL et al. Am J Managed Care 2008;14:131.

BG control

GP: "I wonder if I could ask you about a case…"

52 year taxi driver with type 2 diabetes

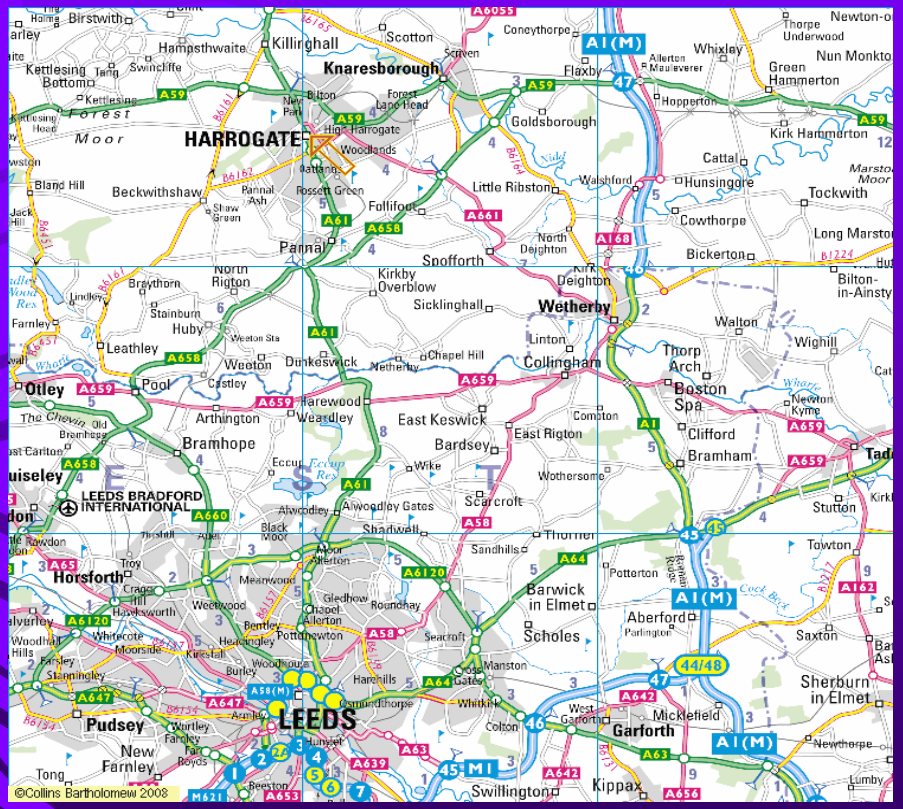
On metformin 1g bd; HbA1c 7.9%

GP added gliclazide 80 mg daily in order to lower HbA1c

Has car crash during episode of hypoglycaemia

Perils of SMBG restriction

- 60 F
- Diagnosed T2DM 2/12 ago – BG 20+
- Started metformin 500 mg BD
- Admitted after crashing car



For the individual

- Are frequency targets sufficient to achieve desired control with minimum amount testing and hypoglycaemia?
- Are they individually justifiable?
- Have they been communicated and understood by the individual?

NICE - SMBG

- 1.4.1 Offer self-monitoring of plasma glucose to a person newly diagnosed with type 2 diabetes only as an integral part of his or her self-management education. Discuss its purpose and agree how it should be interpreted and acted upon.

- 1.4.2 Self-monitoring of plasma glucose should be available:
  - to those on insulin treatment
  - to those on oral glucose-lowering medications to provide information on hypoglycaemia
  - to assess changes in glucose control resulting from medications and lifestyle changes
  - to monitor changes during intercurrent illness
  - to ensure safety during activities, including driving.

- 1.4.3 Assess at least annually and in a structured way:
  - self-monitoring skills
  - the quality and appropriate frequency of testing
  - the use made of the results obtained
  - the impact on quality of life
  - the continued benefit
  - the equipment used.

Evidence-based advice

- Use SMBG for NIT-T2DM
  - Recent diagnosis
  - Lifestyle issues
  - Recurrent hypos
  - Need to tighten control
- Don't use where no benefit/risk harm
- Preferable to a blanket view of cost effectiveness based on flawed evidence