The latest trends in dietary management of type 2 diabetes

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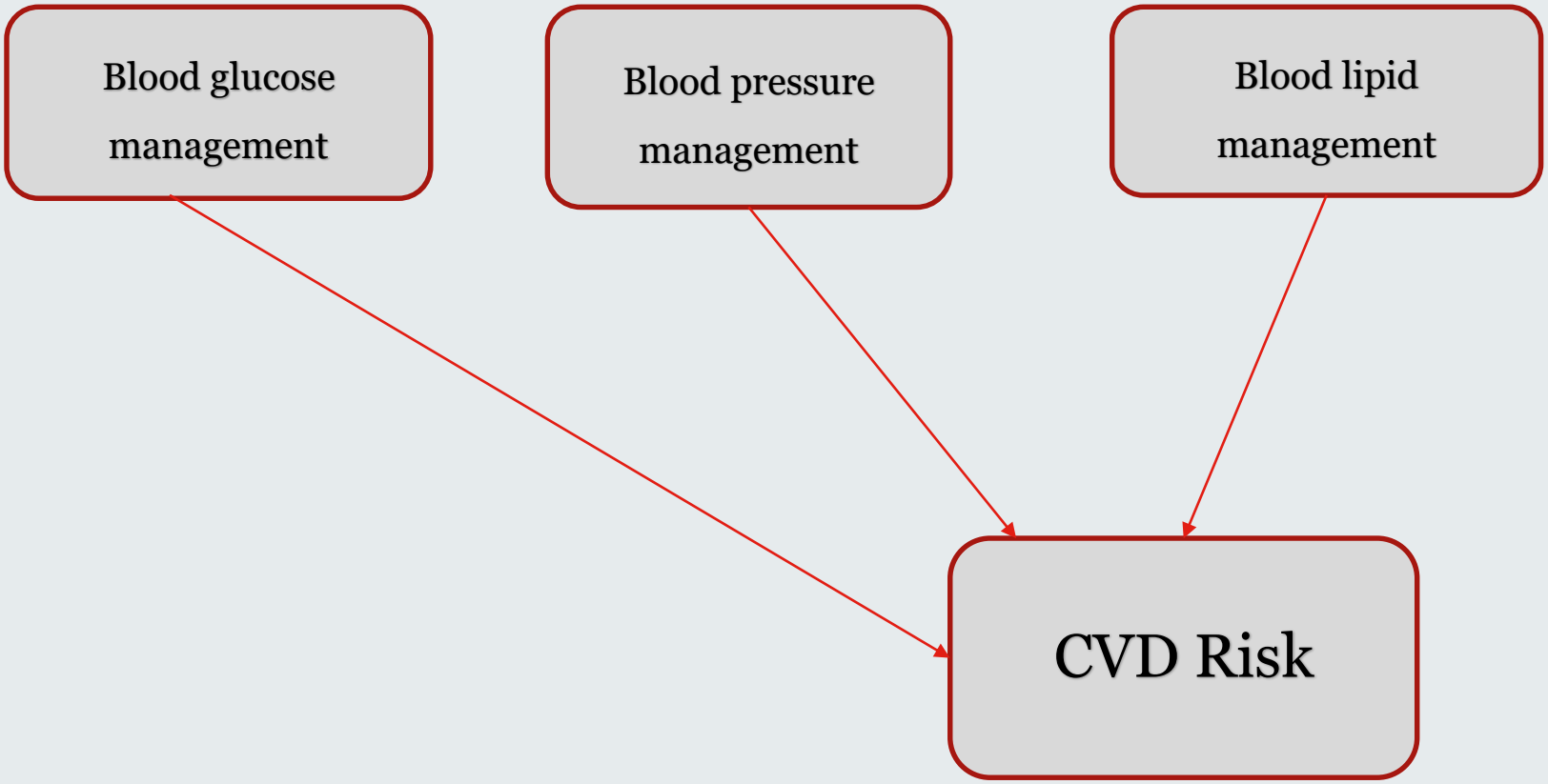
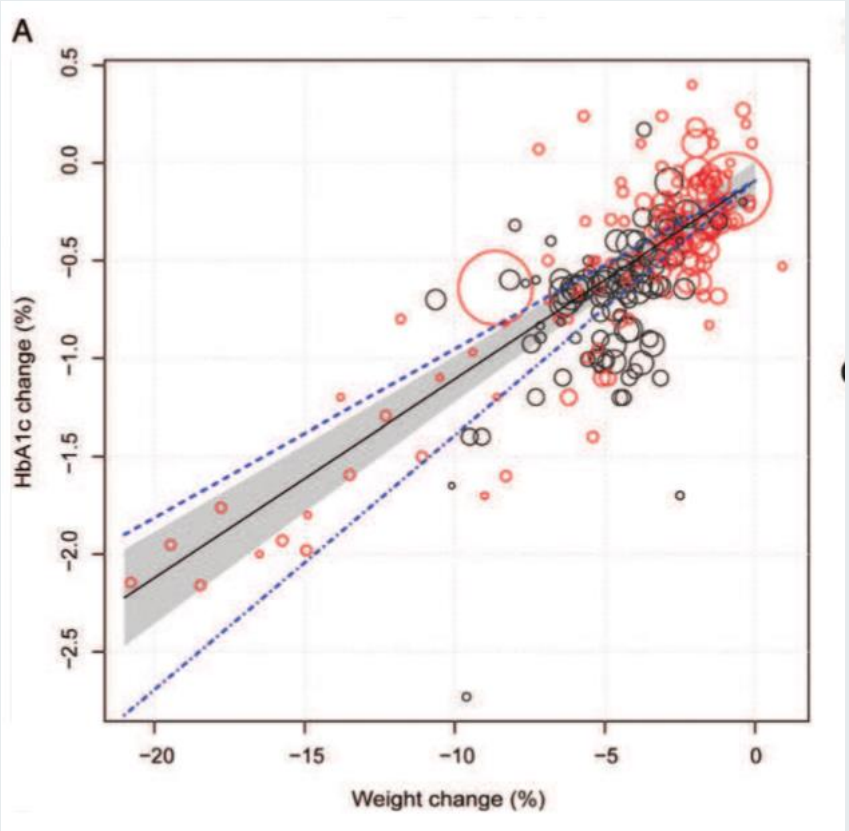
DIETARY MANAGEMENT OF TYPE 2 DIABETES



National Institute of Clinical Excellence: NG28, 2015

Weight Management is (still) the cornerstone



Gummesson A, Nyman E, Knutsson M, Karpefors M. Effect of weight reduction on glycated haemoglobin in weight loss trials in patients with type 2 diabetes. Diabetes Obes Metab. 2017;19(9):1295-1305.

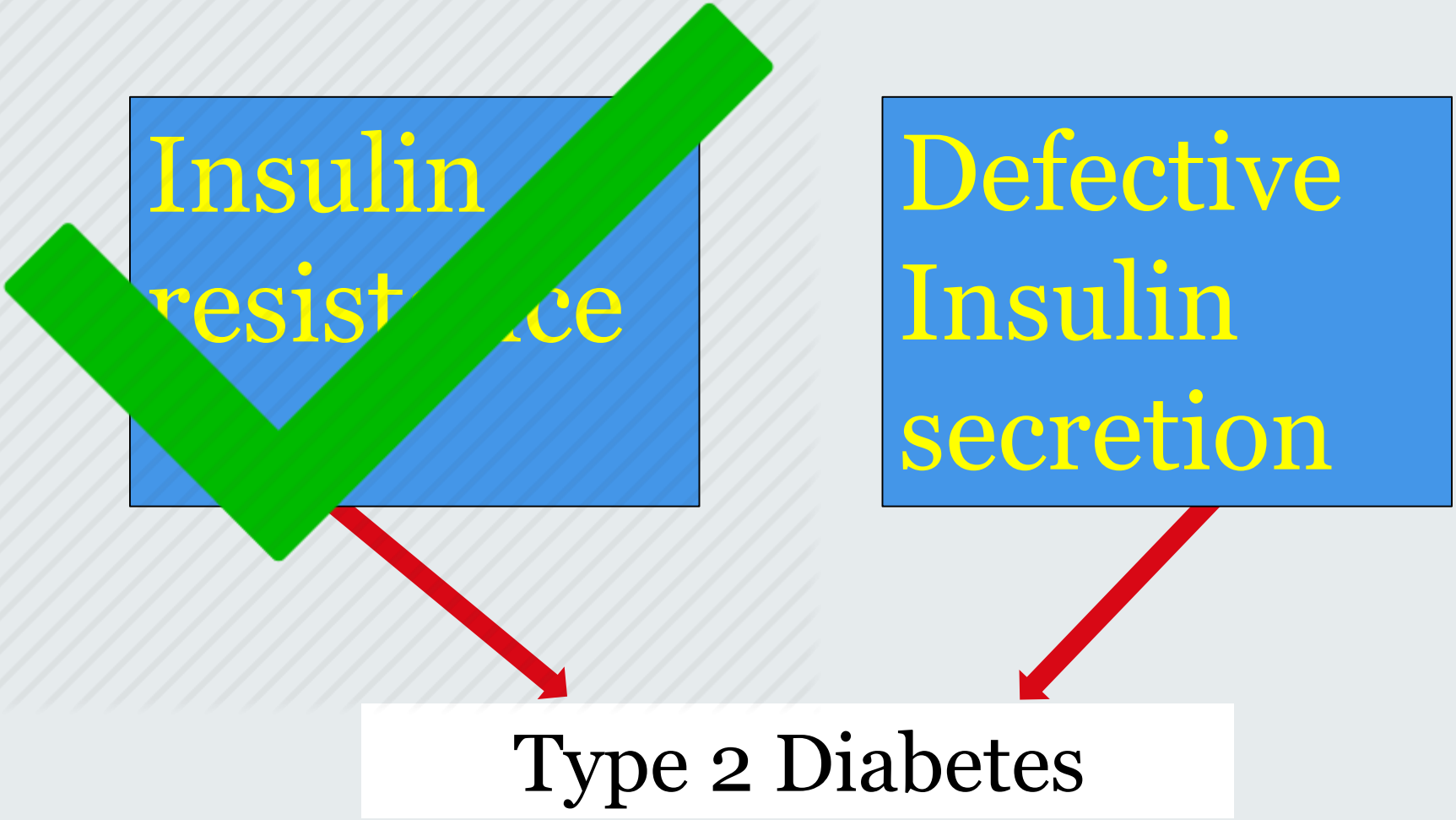
How does [moderate] weight loss lower hbA1c?

Improves insulin sensitivity

Does moderate weight loss improve insulin secretion in type 2 diabetes?

No

Two pathophysiological defects



Newcastle study

11 people with T2D

600kcal for 8 weeks

Inulin sensitivity improved (no surprise)

Glucose normalised by end of week one.

Insulin secretion improved at 8 weeks

Then:

Additional follow-up at 12 weeks after the end of the study:

- Mean weight gain: ~3kg
- Fasting glucose: 5.7 to 6.1mmol/L

Lim EL, Hollingsworth KG, Aribisala BS, Chen MJ, Mathers JC, Taylor R. Reversal of type 2 diabetes: normalisation of beta cell function in association with decreased pancreas and liver triacylglycerol. Diabetologia. 2011;54(10):2506-14.

Diabetes Remission Clinical Trial (DiRECT)

Intervention:

Target ≥15kg weight loss

Withdraw all diabetes medications

Definition of remission:

Normal glucose & off anti-diabetes medications for at least 2 months)

DiRECT
Diabetes Remission Clinical Trial

http://www.directclinicaltrial.org.uk/

DiRECT Results

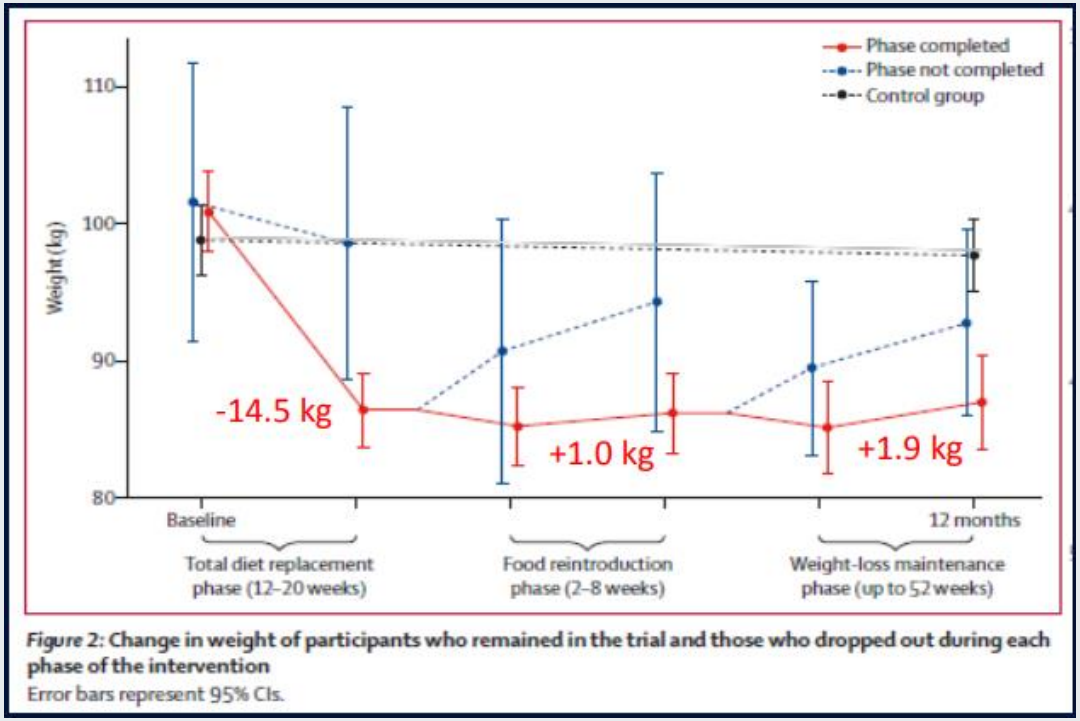


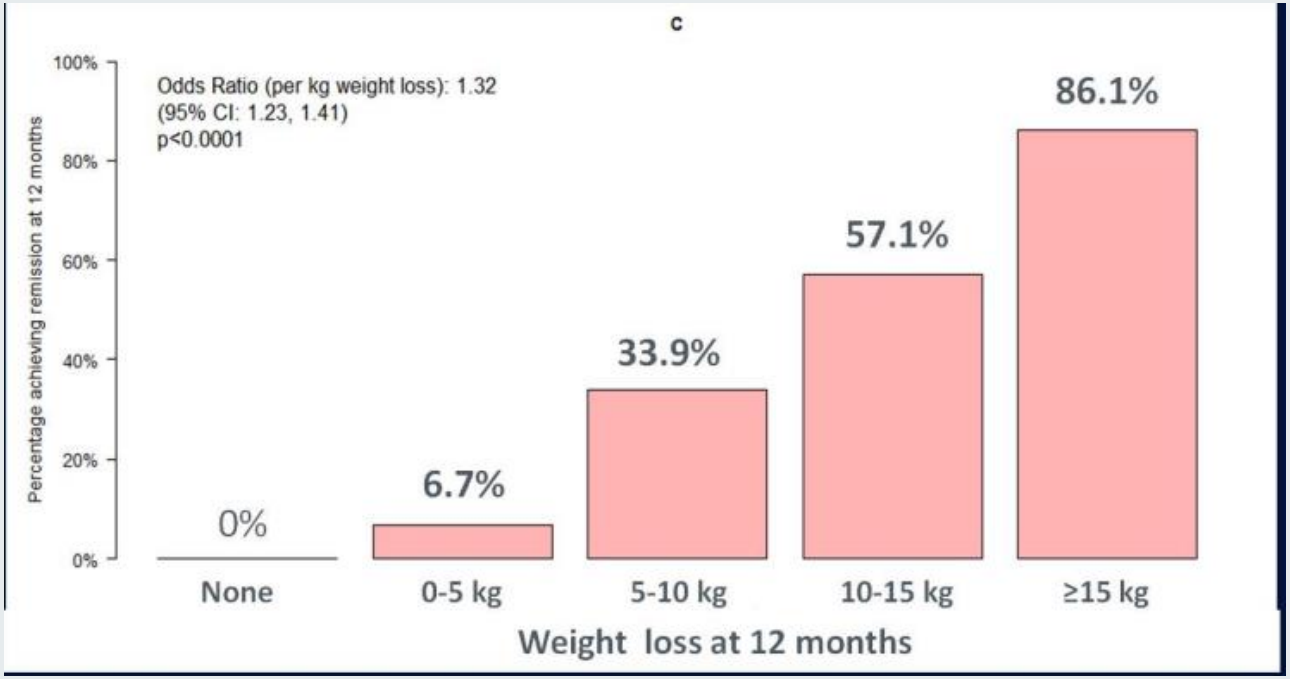
Figure 2: **Change in weight of participants who remained in the trial and those who dropped out during each phase of the intervention**
Error bars represent 95% CIs.

Remission: 46%

http://www.directclinicaltrial.org.uk/

Lean ME et al. Primary care-led weight management for remission of type 2 diabetes (DiRECT): an open-label, cluster-randomised trial. Lancet. 2018 Feb 10;391(10120):541-551.

DiRECT Results



http://www.directclinicaltrial.org.uk/

Lean ME et al. Primary care-led weight management for remission of type 2 diabetes (DiRECT): an open-label, cluster-randomised trial. Lancet. 2018 Feb 10;391(10120):541-551.

Some "baseline" insulin secretion is needed to achieve remission

Differences between responders and non-responders

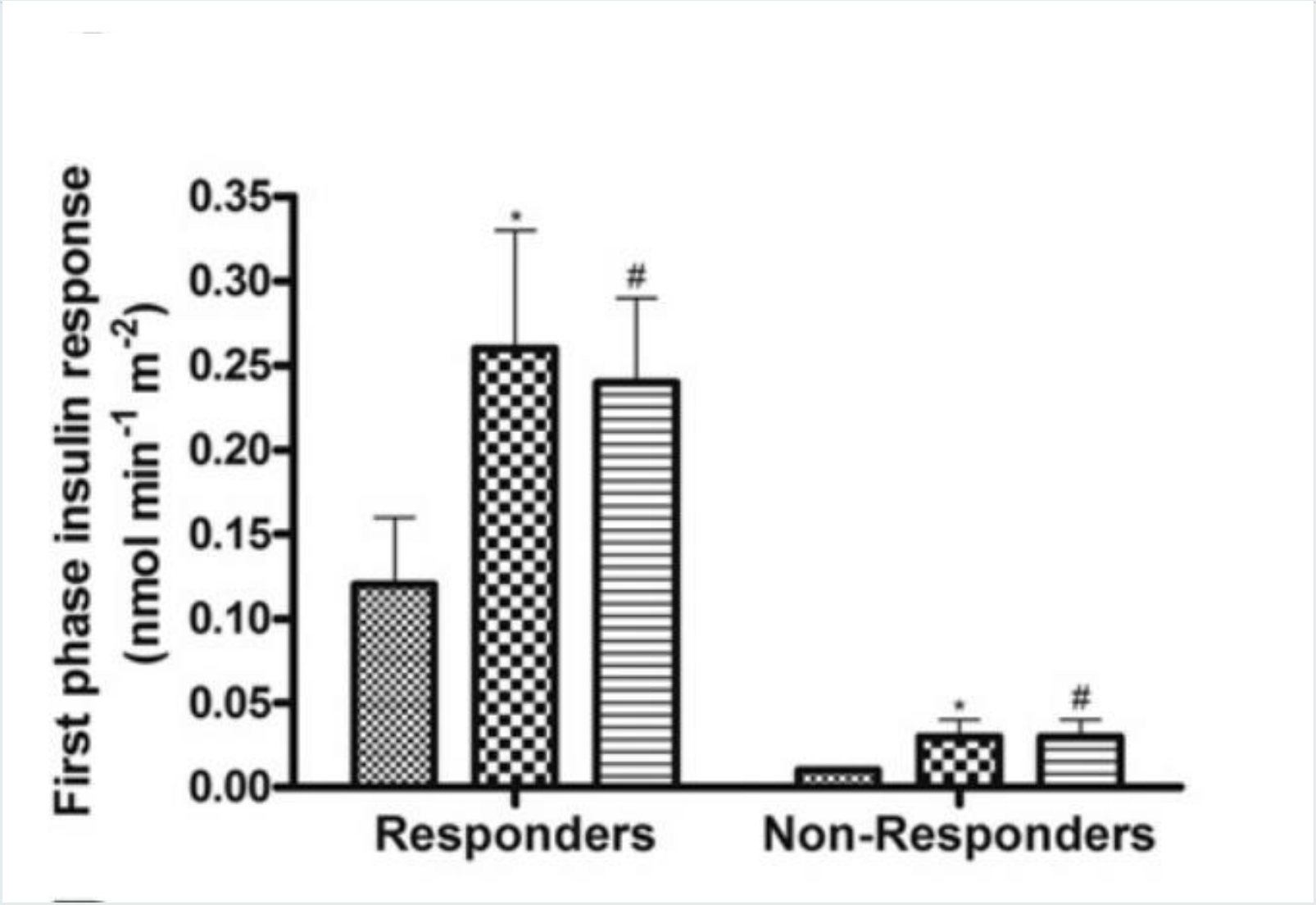
- No difference in insulin resistance
- No difference in liver fat
- SIGNIFICANT DIFFERENCES IN BETA-CELL FUNCTION

Confirms and extends early data:

Wt loss (% bariatric surgery) more likely to be effective in:

- T2D of short duration
- People who have some residual insulin secretion

Baseline insulin secretion is needed to achieve remission



Steven S, Hollingsworth KG, Al-Mrabeh A, Avery L, Aribisala B, Caslake M, Taylor R. Very Low-Calorie Diet and 6 Months of Weight Stability in Type 2 Diabetes: Pathophysiological Changes in Responders and Nonresponders. Diabetes Care. 2016 May;39(5):808-15.

Where next with very low calorie diets & T2D

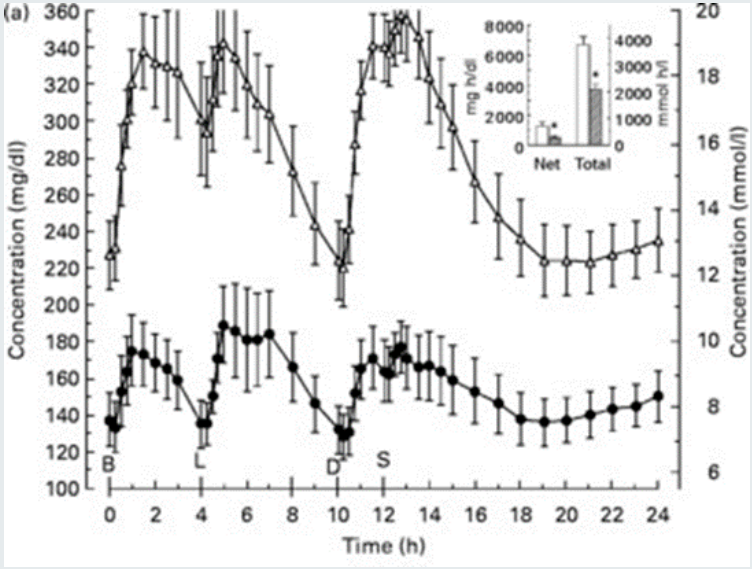
Can it work with a food-based diet?

Any difference in effect between ethnicities?

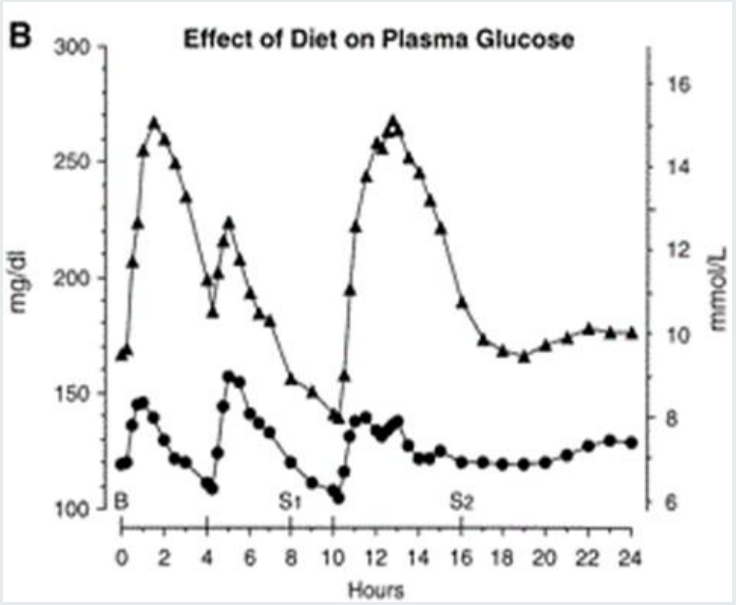
Would a shorter term study work?

Optimum macronutrient content?

Low-carb may lower blood glucose WITHOUT NEEDING weight loss!



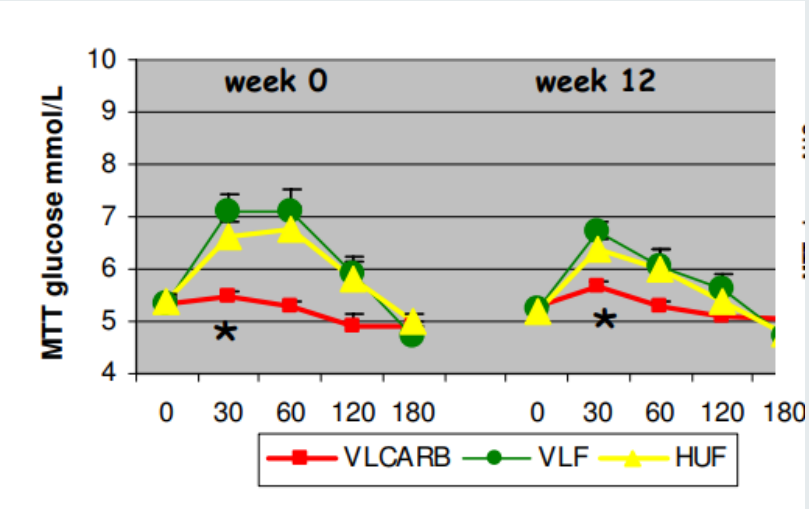
20%kcal from carbs

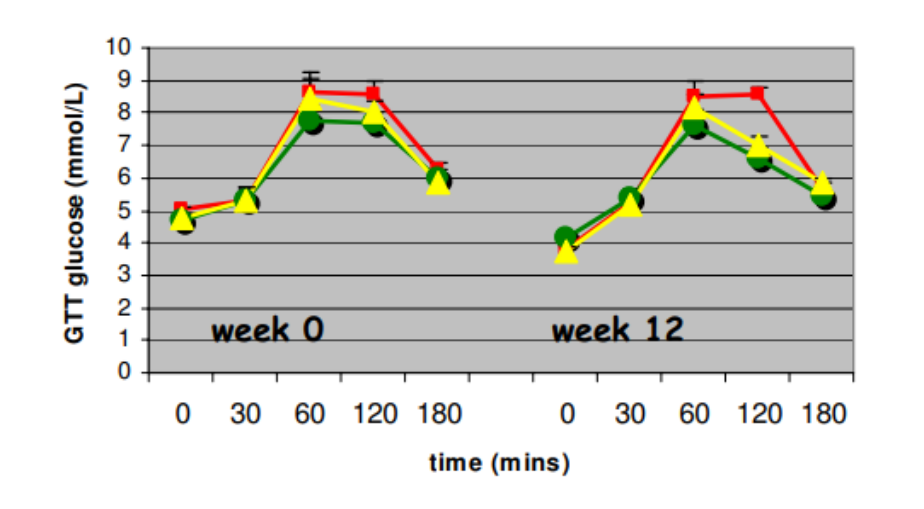


30%kcal from carbs

Gannon MC, Nuttall FQ. Diabetes. 2004 Sep;53(9):2375-82.
Nuttall FQ, Schweim K, Hoover H, Gannon MC. Br J Nutr. 2008;99(3):511-9.

But: does not alter underlying pathophysiology





Noakes 2006 Nutrition and Metabolism

Unclear: does it matter if carb replaced with protein or fat?

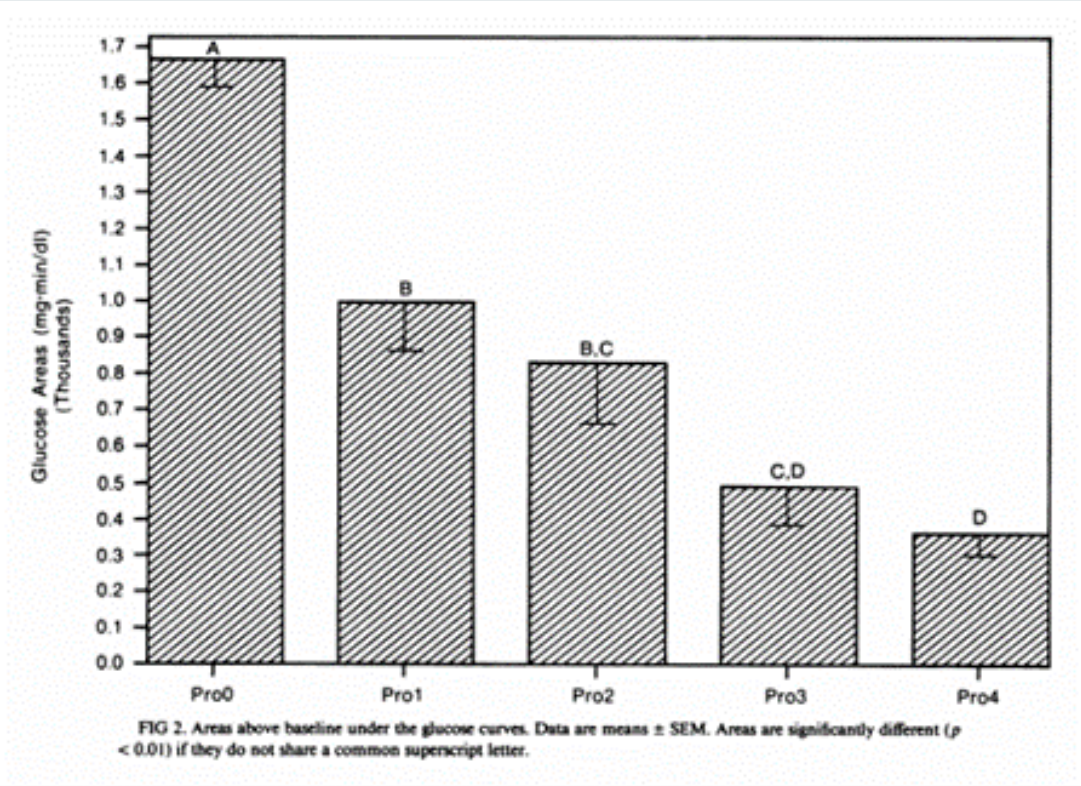


FIG 2. Areas above baseline under the glucose curves. Data are means ± SEM. Areas are significantly different ($p < 0.01$) if they do not share a common superscript letter.

The amount of carbohydrate in the meals was constant (58g/meal). The amount of protein in the meals was as follows: Pro0=0g; Pro1=16g; Pro2=25g; Pro3=34g; Pro4=50g.

Low-carb diets: unanswered questions

- How low is “low carb”?
  - Moderate reduction in carbohydrates does not lower glucose in absence of weight loss

- Effect on cardiovascular risk?
  - Glucose more likely to reduce on low-carb (depending on how low)
  - Triglycerides more likely to reduce on low-carb
  - HDL-c more likely to increase on low-carb
  - BUT LDL-c can rise, markedly in some.

- What do people eat on low-carb?
  - Socioeconomic considerations

Moving from management to remission

Remission is possible

Data collection in primary care

Need to *communicate* this to patients

Can come off meds! (Even insulin!)

#hope