

Diabetes Update and cardiovascular risk assessment

Age-Adjusted Prevalence of Obesity and Diagnosed Diabetes Among US Adults

1994

Obesity (BMI ≥ 30 kg/m²)

Diabetes



Missing Data	<14.0%
14.0%–17.9%	18.0%–21.9%
22.0%–25.9%	≥26.0%



Missing data	<4.5%
4.5%–5.9%	6.0%–7.4%
7.5%–8.9%	≥9.0%

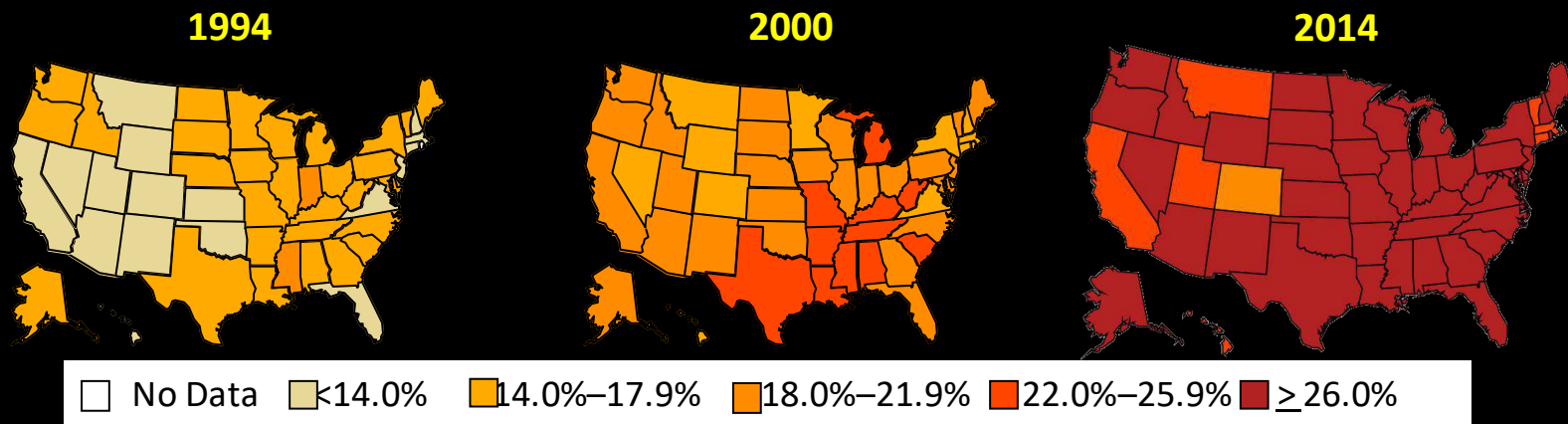


CDC's Division of Diabetes Translation, United States Diabetes Surveillance
System available at <http://www.cdc.gov/diabetes/data>

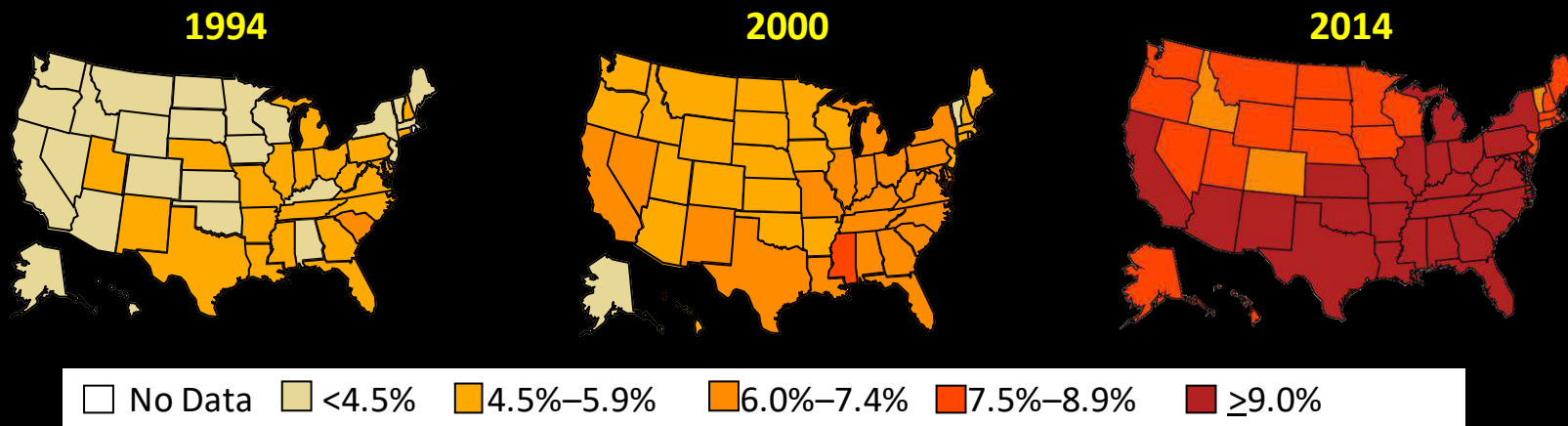


Age-adjusted Prevalence of Obesity and Diagnosed Diabetes Among US Adults

Obesity (BMI ≥ 30 kg/m²)



Diabetes



CDC's Division of Diabetes Translation. United States Surveillance System available at <http://www.cdc.gov/diabetes/data>

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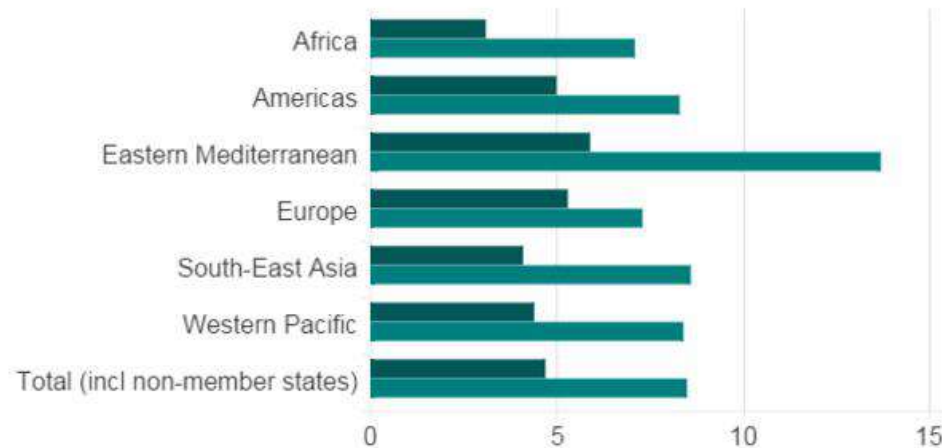
Deadly diabetes in 'unrelenting march'

By James Gallagher
Health editor, BBC News website

🕒 6 April 2016 | Health

Estimated prevalence of adults with diabetes in WHO regions

■ % in 1980 ■ % in 2014



Source: WHO

BBC

How diabetes has taken its toll

422 million
adults were living with diabetes in 2014 - that's

314 million
more than there were in 1980

8.5% of adults worldwide has diabetes

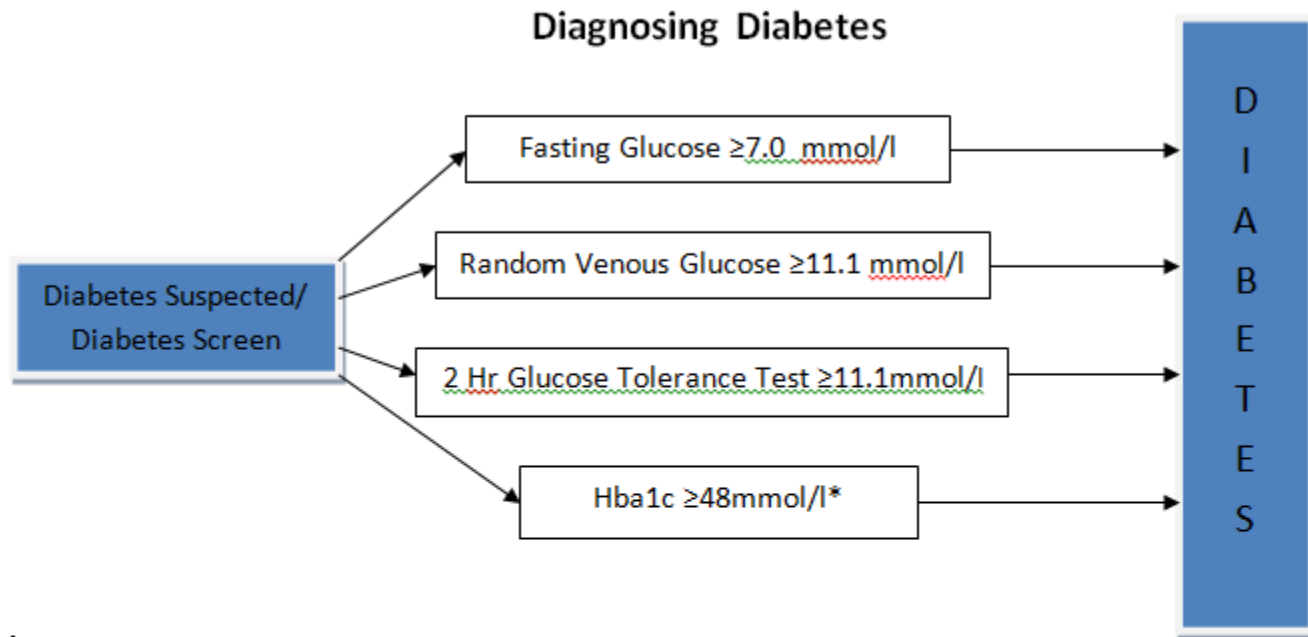
1.5 million people died as a result of diabetes in 2012

2.2 million additional deaths were caused by higher-than-optimal blood glucose

43% of these 3.7m people died before they were 70 years old

Source: WHO

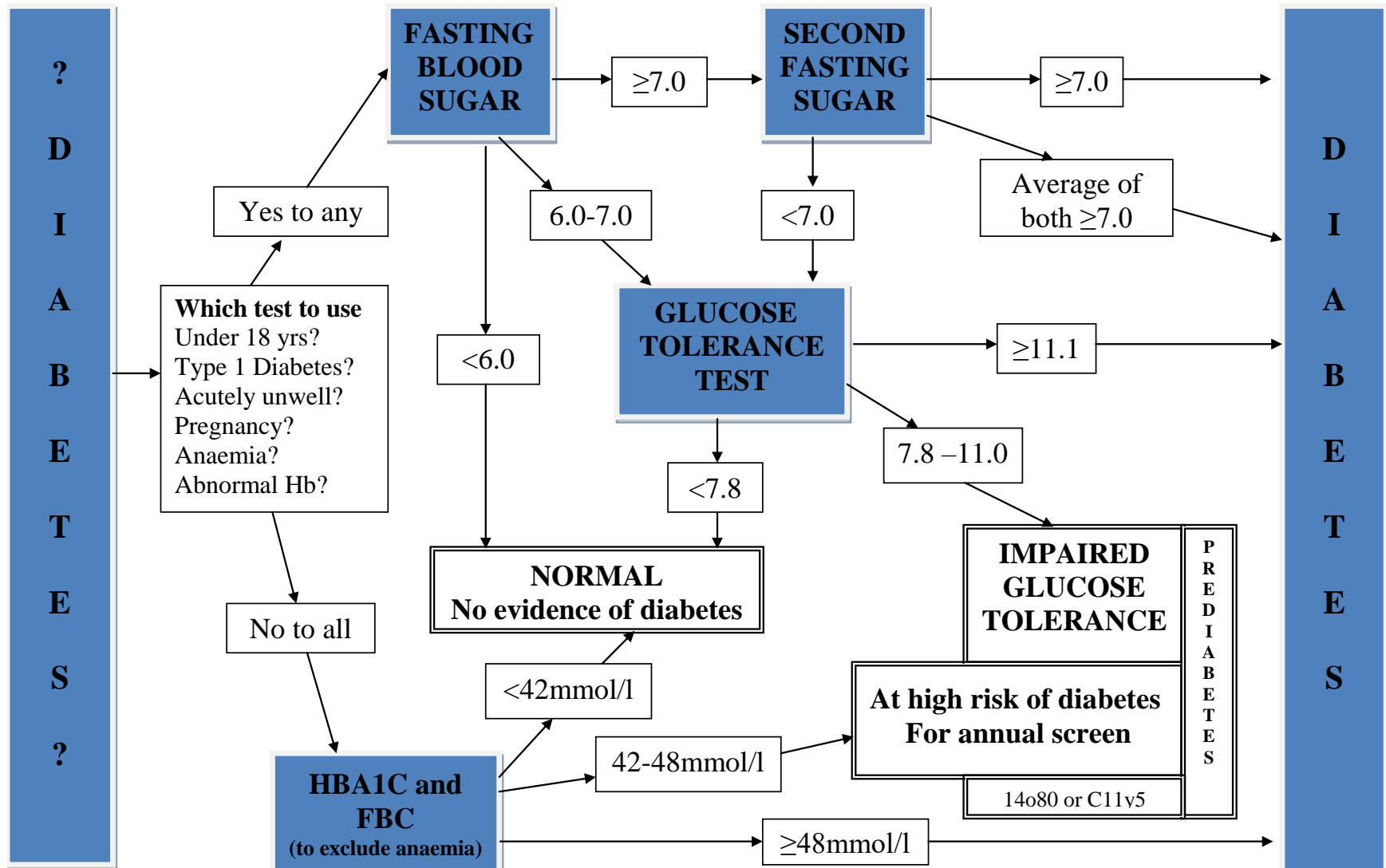
How do I Diagnose Diabetes?



* Not suitable for under 18s, when ? type 1, those acutely ill, pregnancy, anaemia, abnormal Hb

- **For patients with symptoms** (polyuria, polydipsia, unexplained weight loss) one reading is sufficient.
- **For patients without symptoms**, a second test, on a different day, within the diabetic range is required.
- For clarity, if a second test is required, stick with the same test (eg if fasting sugar is ≥ 7.0 then repeat a further fasting glucose). When using Hba1c there is no need to wait 3 months to repeat – consider a second test to confirm.
- If the second test is normal patient is likely at higher future risk of diabetes.

Diagnosing Diabetes (1)



- How do I keep perspective in looking after patients with diabetes?

Keeping Perspective

Variable	CHD (fatal and non-fatal MI and sudden death)	Stroke
Cholesterol down 1mmol NNT for 5 years to prevent one event	59	178
BP down by 10/5 mm Hg NNT for 5 years to prevent one event	62	74
Hba1c down by 10 mmol/mol NNT for 5 years to prevent one event	140	768

Intensified glucose lowering in type 2 diabetes - time for a reappraisal J. S. Yudkin & B. Richter & E. A. M. Gale Diabetologia 2010

- Age matters – while intensive glucose control may benefit the young, moderate control is sufficient for most patients with later onset diabetes.
- “Always hesitate before giving lifestyle advice to someone who has already survived 80 years!”

Perspective Matters

65 year old woman Type 2 diabetes, HbA1c 64mmol/mol on maximal oral Rx.

What are the benefits of starting insulin?

Perspective Matters

65 year old woman Type 2 diabetes, HbA1c 64mmol/mol on maximal oral Rx.

What are the “benefits” of starting insulin?

- **4773** daily injections (13 years of treatment) yields 0.4 of a quality adjusted life year.
- **366,600** injections (1000 years of treatment) to prevent one (non-fatal) myocardial infarction
- The risk of serious hypoglycaemia would be increased with insulin by 5% per year.

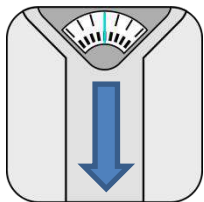
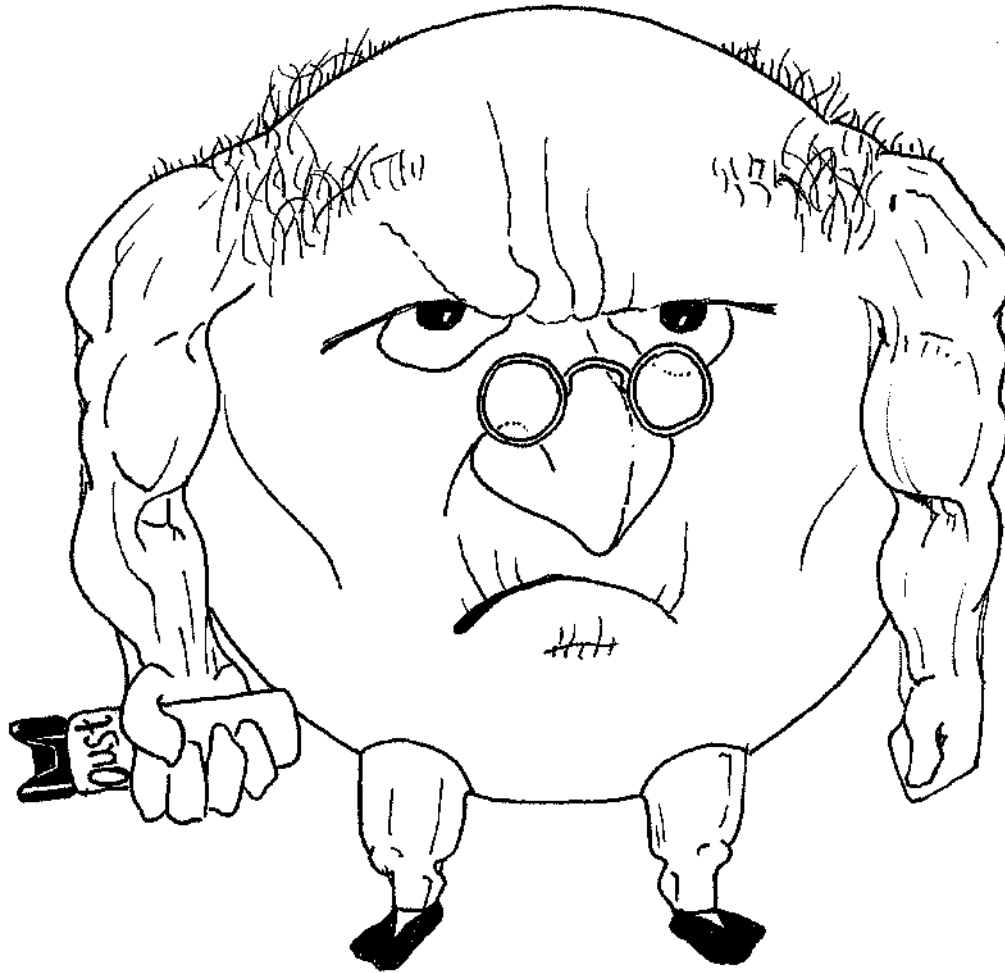
Diabetes Treatments

- Meet the Players....

Metformin

Biguanide

PPM £3.20



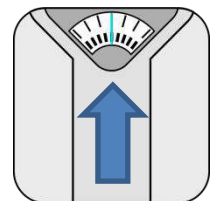
~~eGFR
<30~~

Gliclazide

PPM £3.20

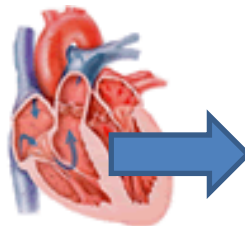
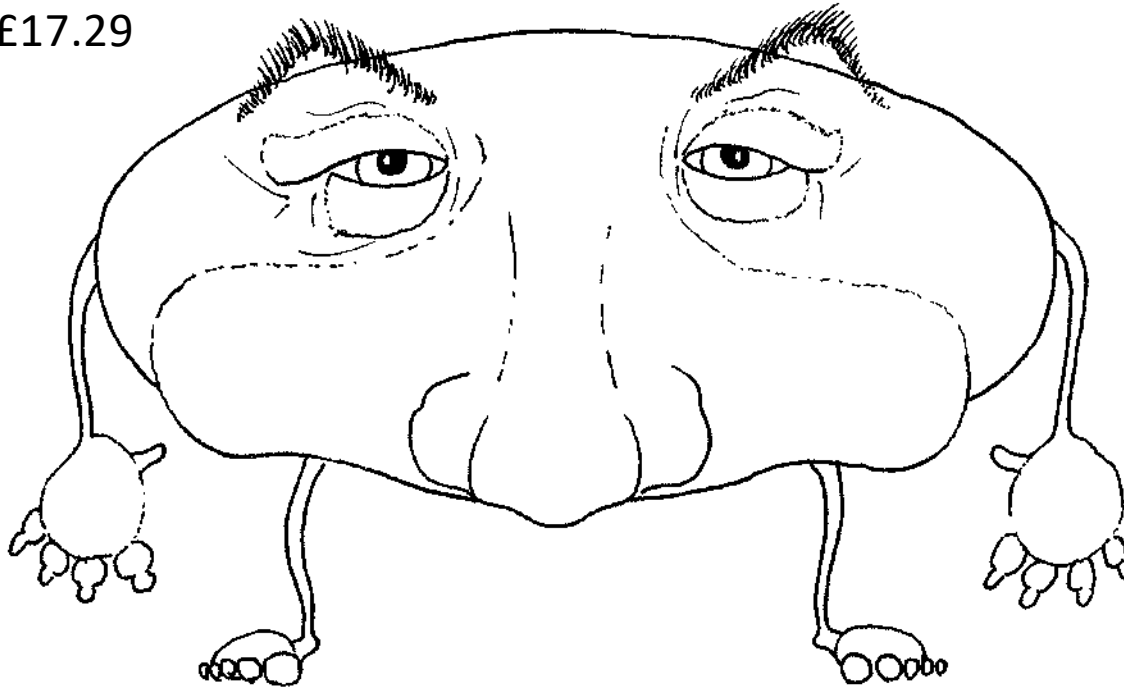


Sulfonylurea



Pioglitazone/ (Rosiglitazone RIP)

PPM £17.29



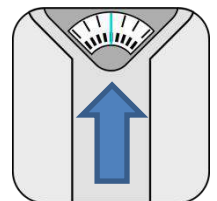
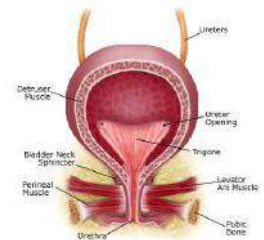
Glitazones



Heart
Failure



Bladder Muscle Anatomy



Glycemic Control to Reduce CAD

DCCT trial:

- 1441 patients, type 1 diabetes
- Randomized to intensive glycemic control vs. conventional therapy
- Monitored prospectively for 6.5 years
- Results:
 - Less retinopathy by 50%
 - Macrovascular complications: 41% reduction (not statistically significant)
 - Small number of events in young patient cohort

UKPDS:

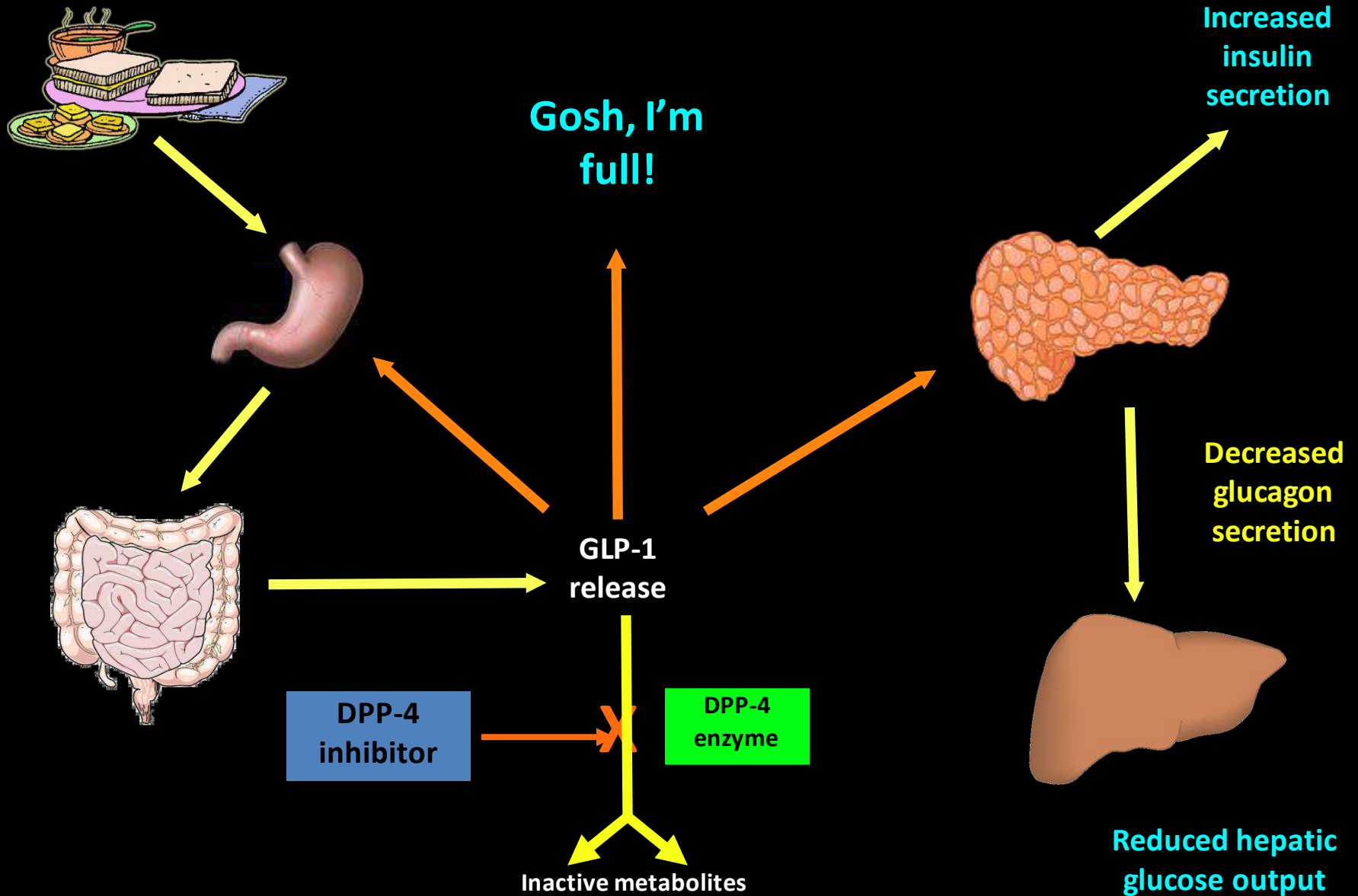
- 3867 patients with newly diagnosed type 2 DM
- Intensive vs. Conventional therapy
- 10 year follow-up
- Microvascular endpoints improved
- Trend only towards reduced incidence of MI ($p=0.052$)

Diabetes Treatments

* Just a little bit of post-prandial physiology...

GLP-1

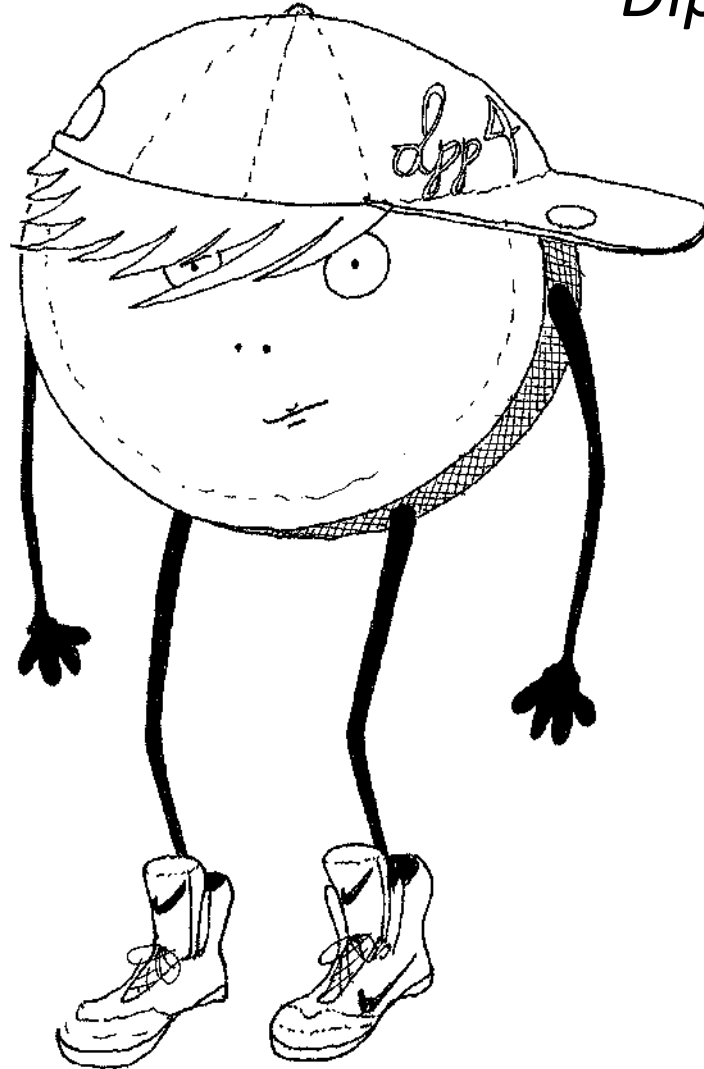
Mechanisms of Action



Alo/lina/saxa/sita/vilda

....gliptin

PPM £31.60



DPP4 inhibitors

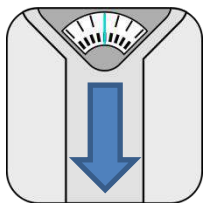
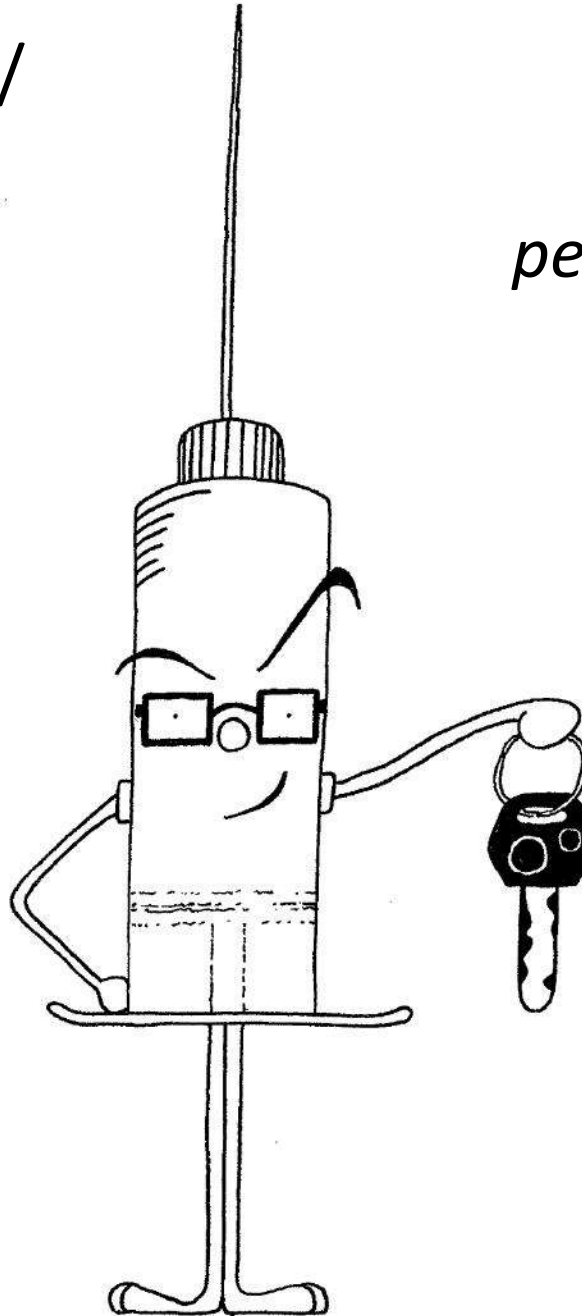
*Dipeptidyl peptidase-4
inhibitor*



Exenatide/liraglutide/
Lixisenatide

PPM £78.48

GLP Agonists
*Glucagon like
peptide 1 mimetic*

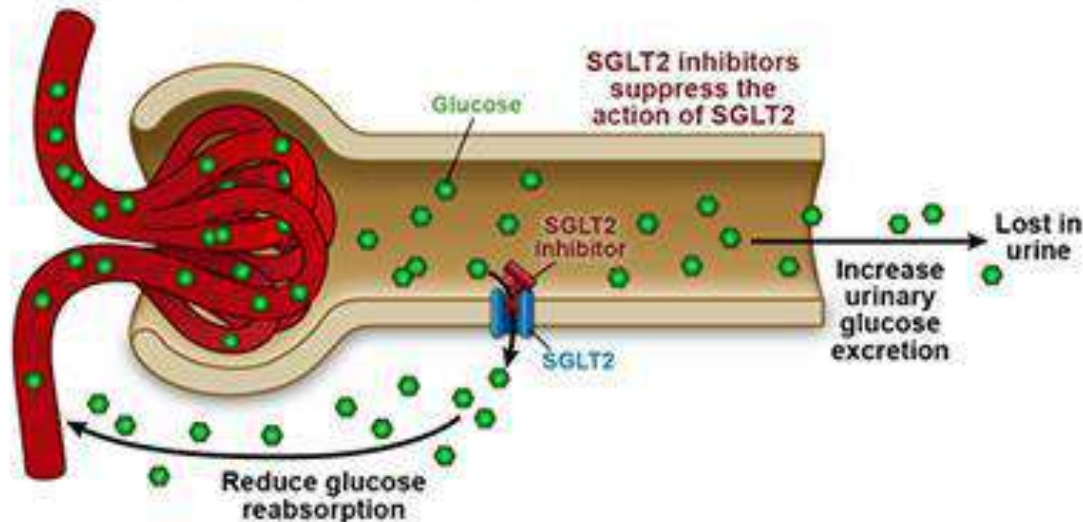


Diabetes Treatments

- * Just a little bit of renal excretory physiology...

SGLT2 Inhibitor Mechanism of Action

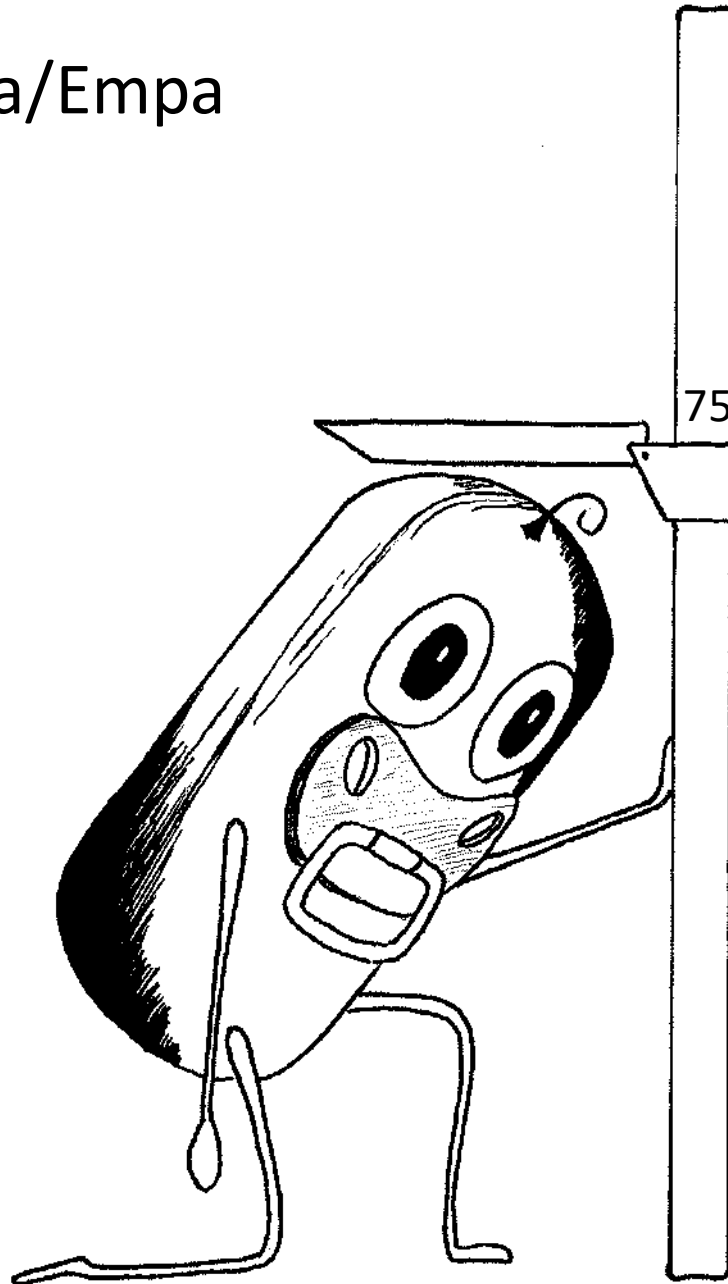
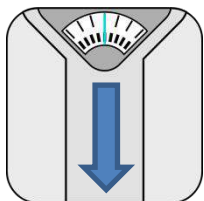
- SGLT2 inhibitors work in the proximal tubules of the kidney to block the reabsorption of glucose back into the blood system, thus reducing blood glucose levels



- DKA is a severe metabolic condition usually characterized by hyperglycemia resulting from a relative insulin deficient state

Dapa/Cana/Empa
...gliflozin

PPM £36.59



SGLT2 inhibitors
*Sodium-glucose
co-transporter 2
inhibitors*

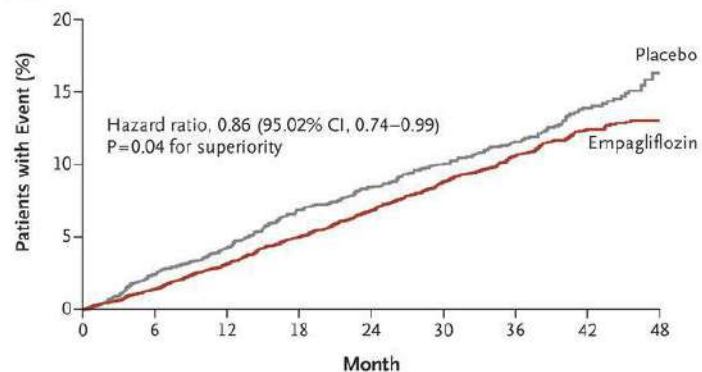
Weird !
DKA •

UTI ↑
Thrush

~~eGFR
<60~~

~~Age
>75~~

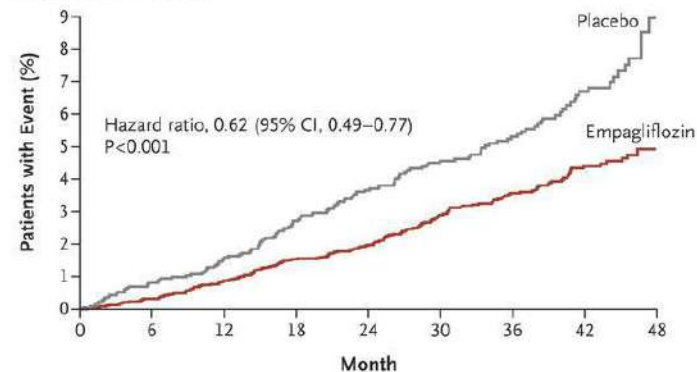
A Primary Outcome



No. at Risk

Empagliflozin	4687	4580	4455	4328	3851	2821	2359	1534	370
Placebo	2333	2256	2194	2112	1875	1380	1161	741	166

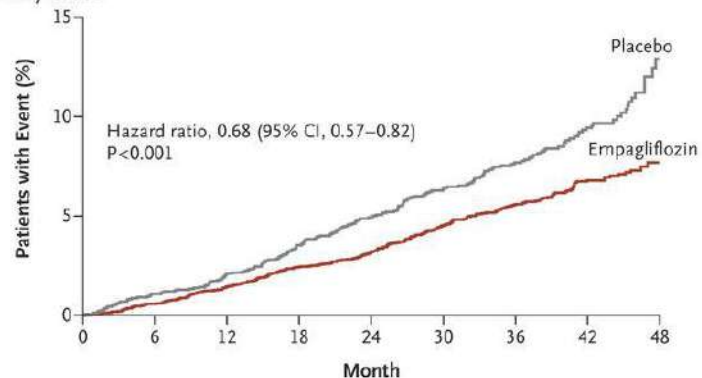
B Death from Cardiovascular Causes



No. at Risk

Empagliflozin	4687	4651	4608	4556	4128	3079	2617	1722	414
Placebo	2333	2303	2280	2243	2012	1503	1281	825	177

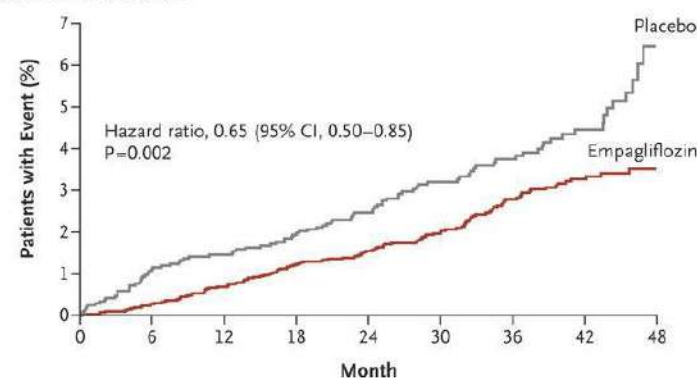
C Death from Any Cause



No. at Risk

Empagliflozin	4687	4651	4608	4556	4128	3079	2617	1722	414
Placebo	2333	2303	2280	2243	2012	1503	1281	825	177

D Hospitalization for Heart Failure



No. at Risk

Empagliflozin	4687	4614	4523	4427	3988	2950	2487	1634	395
Placebo	2333	2271	2226	2173	1932	1424	1202	775	168

NEJM Nov 2015 Empagliflozin, Cardiovascular Outcomes, and Mortality in Type 2 Diabetes

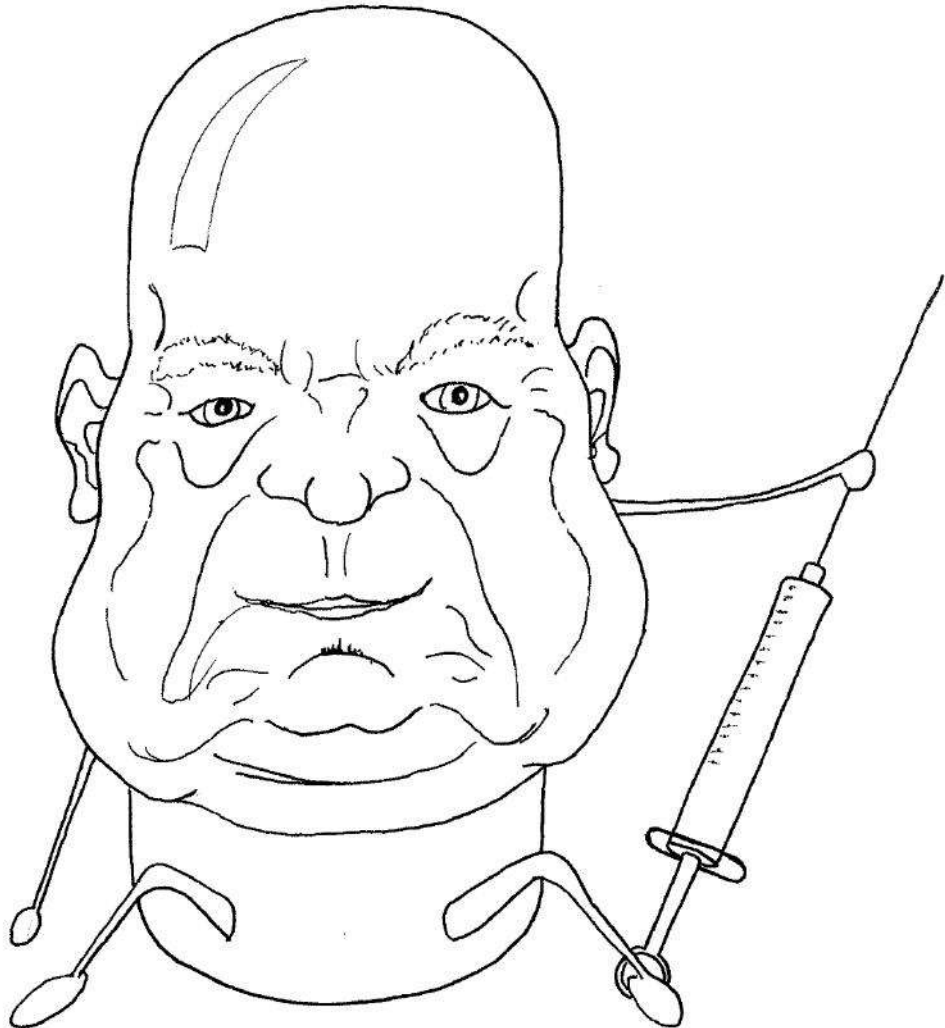
Diabetes Treatments

- Never forget who got us through the war....
(...respect to Gary Oldman)

NPH (isophane) PPM 21.70

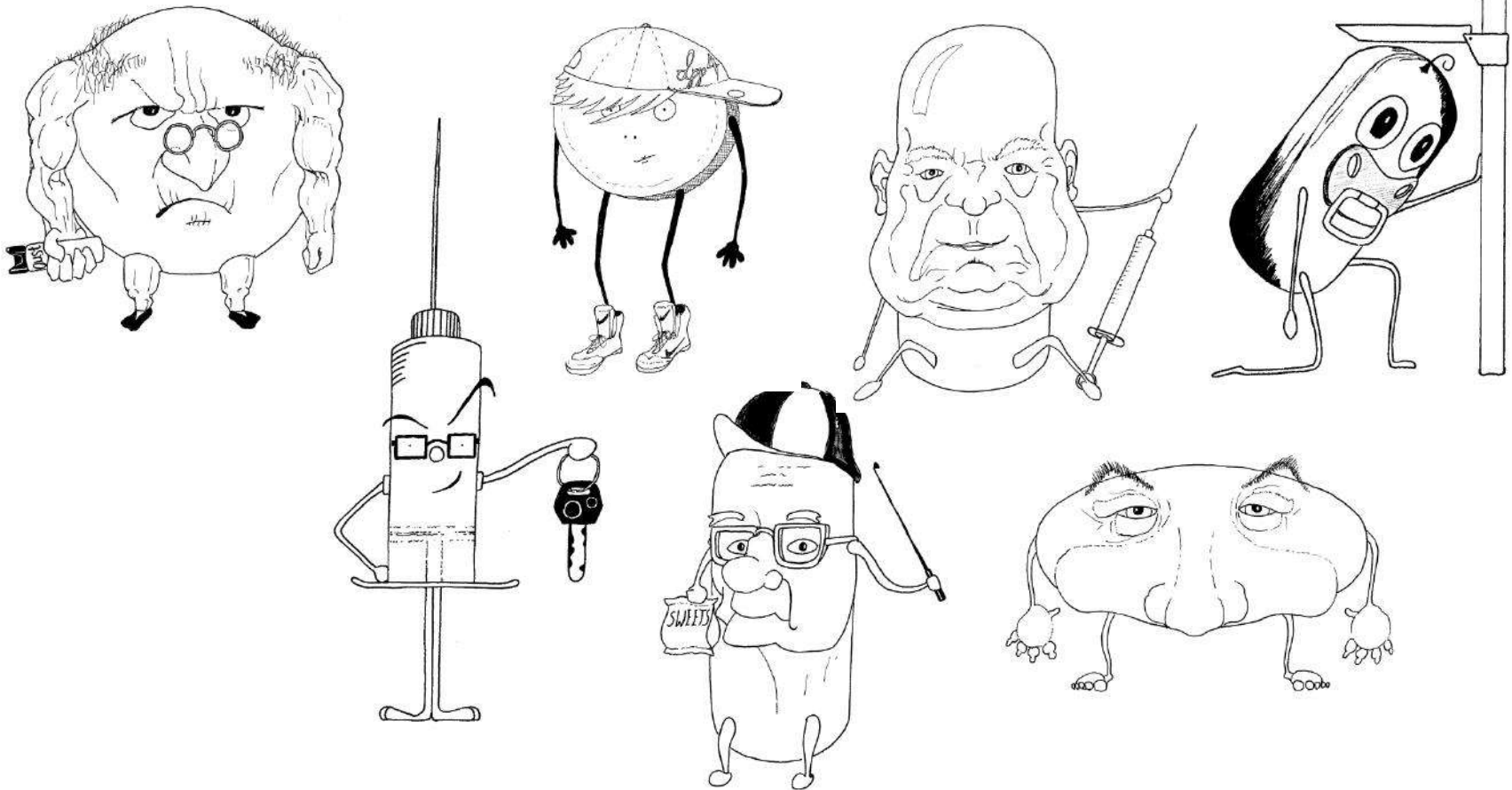
Insulin

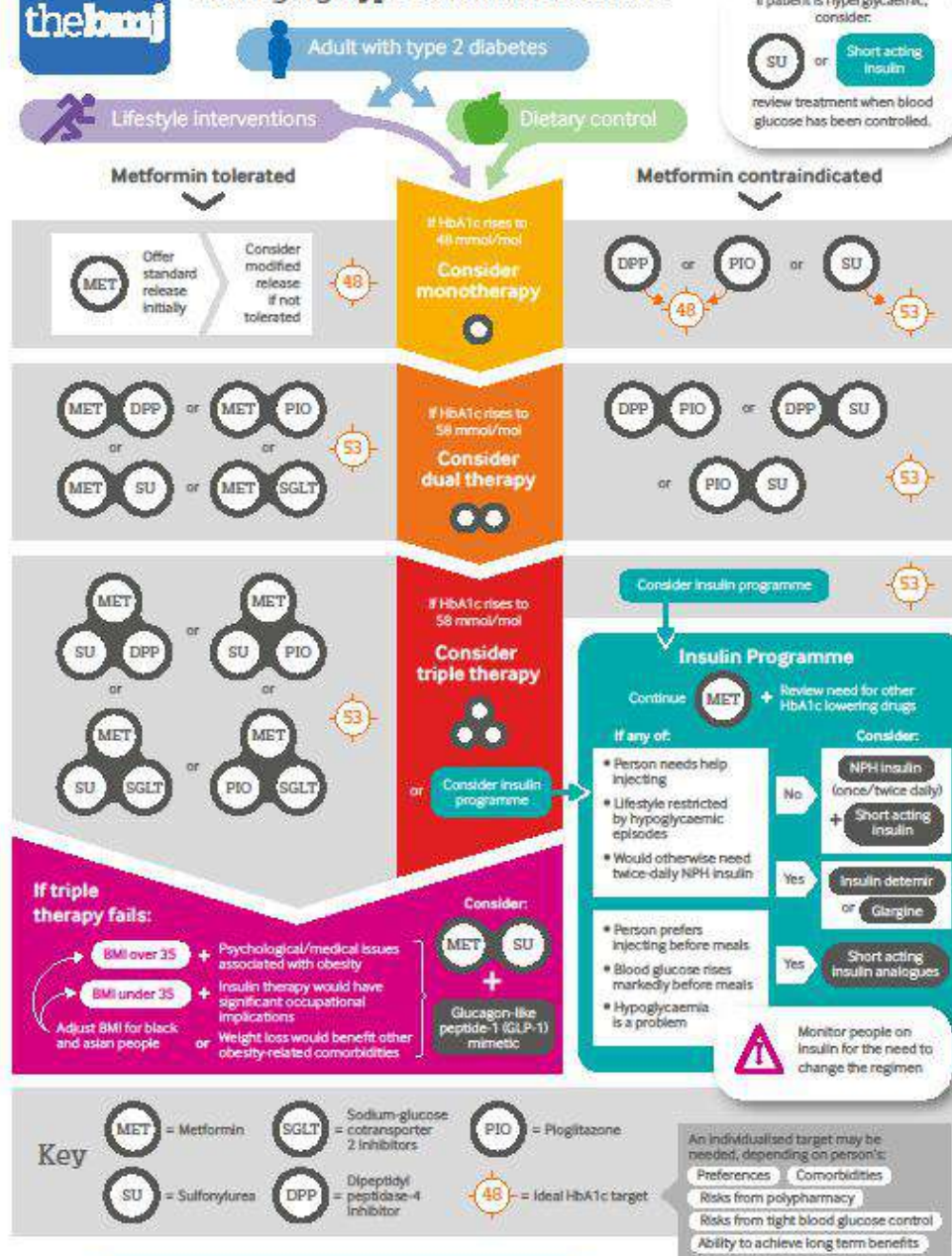
Analogues (determir/ glargine) PPM 41.50



Diabetes Treatments

- See how they work together...





Summary of Updated NICE guidance April 2016

- Glycaemic control is **only one aspect** of care of type 2 diabetes
- Involve patients in target setting of Hba1c
- Metformin remains first line
- Self monitoring – home BMs – only if
 - On insulin/ oral meds causing hypos/ evidence of hypos/pregnant/ as part of education.
 - Stick to the formulary meters!
- Do not give aspirin or clopidogrel for primary prevention
- Offer structured education to all (watch for update on DESMOND later)
- Blood pressure targets remain at 140/80, but 130/80 if kidney, eye or cerebrovascular damage.
- STATINS – use atorvastatin 20mgs
- Type 1 primary prevention if >40yrs, Diabetes >10yrs, nephropathy or other CVD risk factors
- Type 2 primary prevention – **Either** “All Patients” Joint British Societies
Or if CVD risk is >10% on Qrisk/JBS3

www.jbs3risk.com

Profile

Date of Birth: Day 2 Month 11 Year 1967

Gender: ☒ male ☐ female

Ethnic group: White or not stated

Height (m): 1.83 6' 0" (72.0") Weight (kg): 100.0 156lb 10.5 (220.5 lb) BMI: 29.9

Townsend quintile (3 if unknown): 4



I have never suffered from Cardiovascular Disease ☒

I have read the [terms and conditions](#) ☒

Do you smoke? I smoke 20+/day

Total Cholesterol: 5.5 mmol/L

HDL Cholesterol: 1.2

NonHDL Cholesterol: 4.3

Systolic Blood Pressure: 160 mm Hg

Have you received blood pressure treatment? ☐

Do you suffer from diabetes? ☒

Does a close relative under 60 suffer from CVD? ☐

Do you have a chronic kidney disease? ☐

Have you suffered atrial fibrillation? ☐

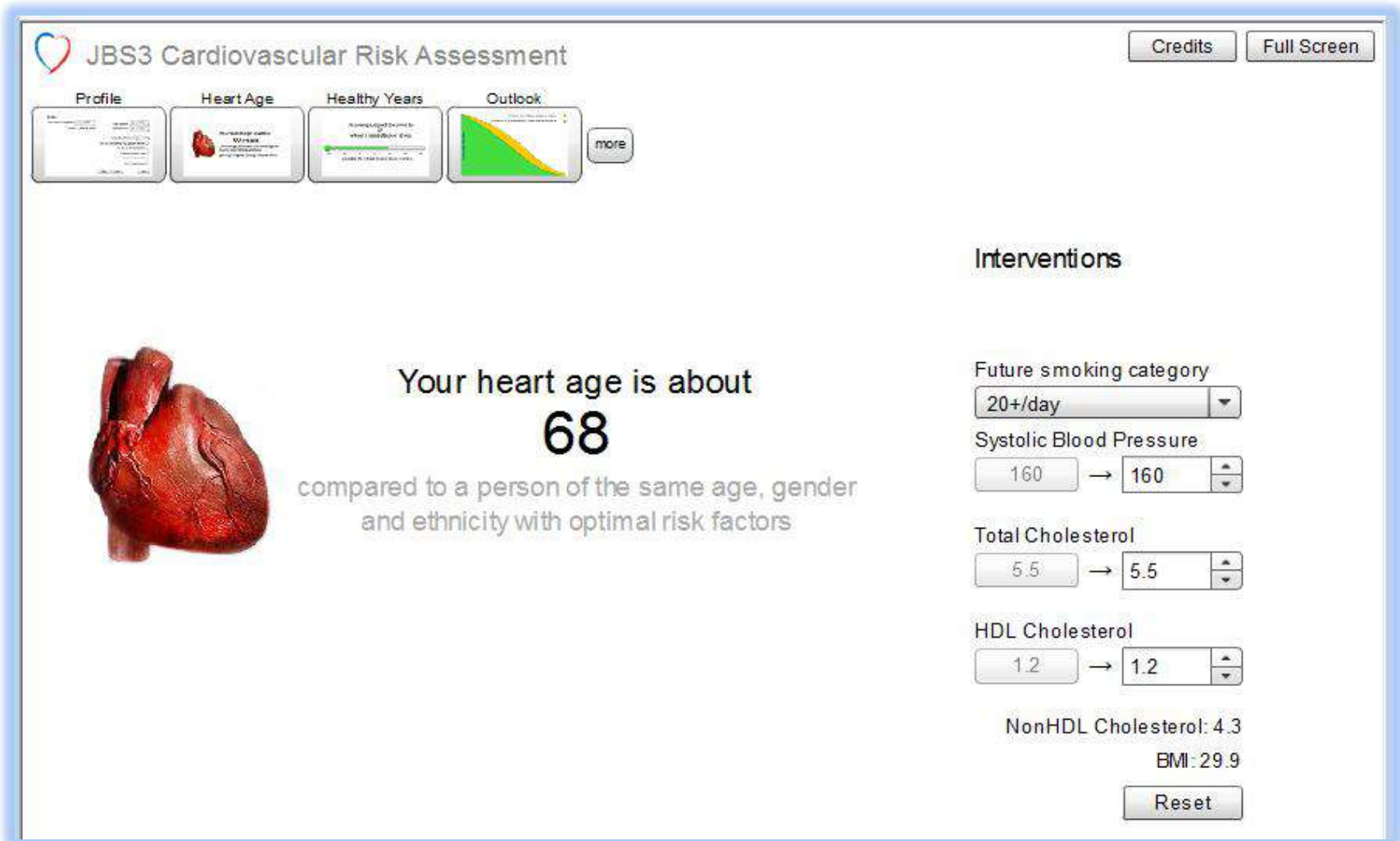
Do you have rheumatoid arthritis? ☐

Save

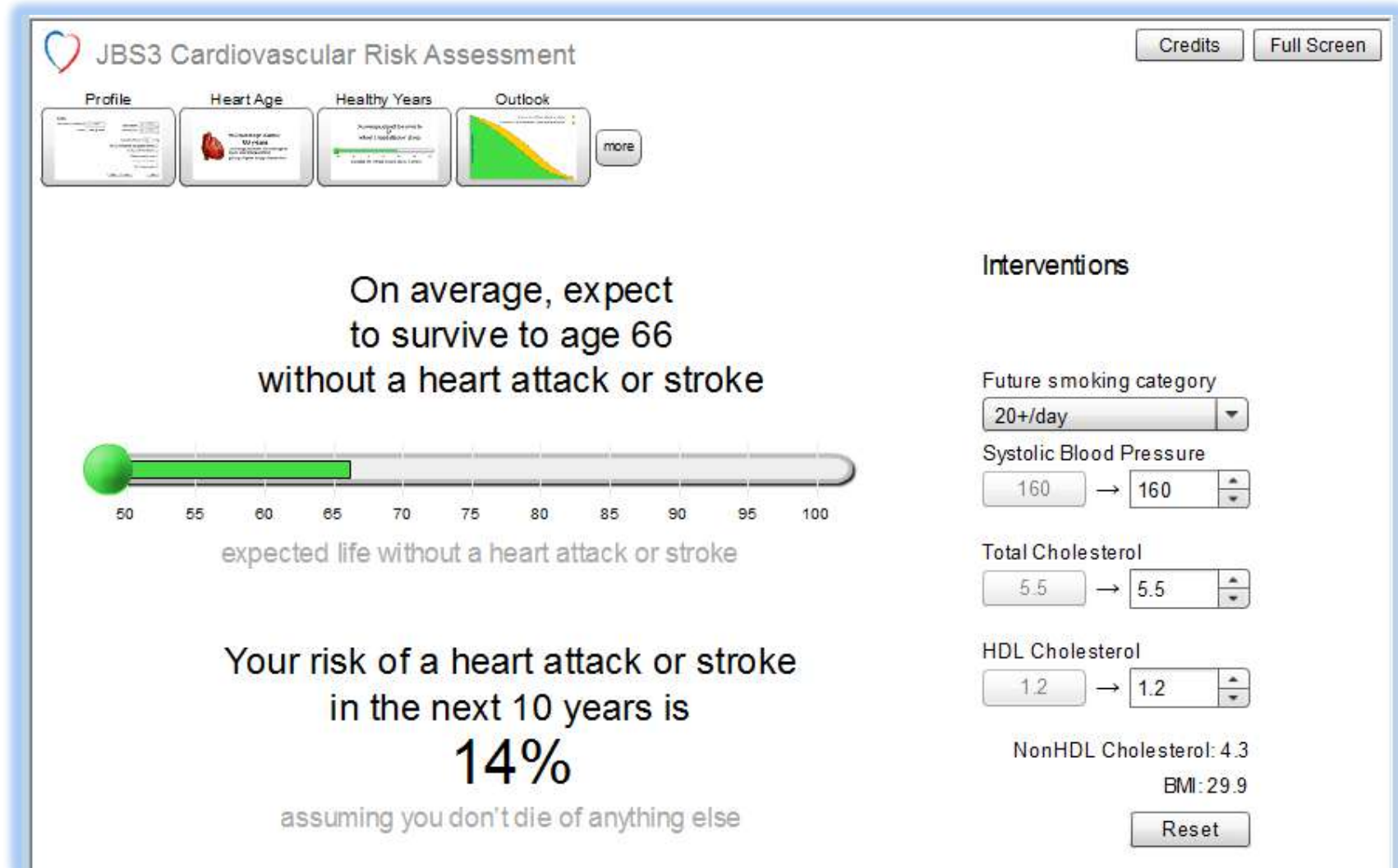
Load

Next

Heart Age

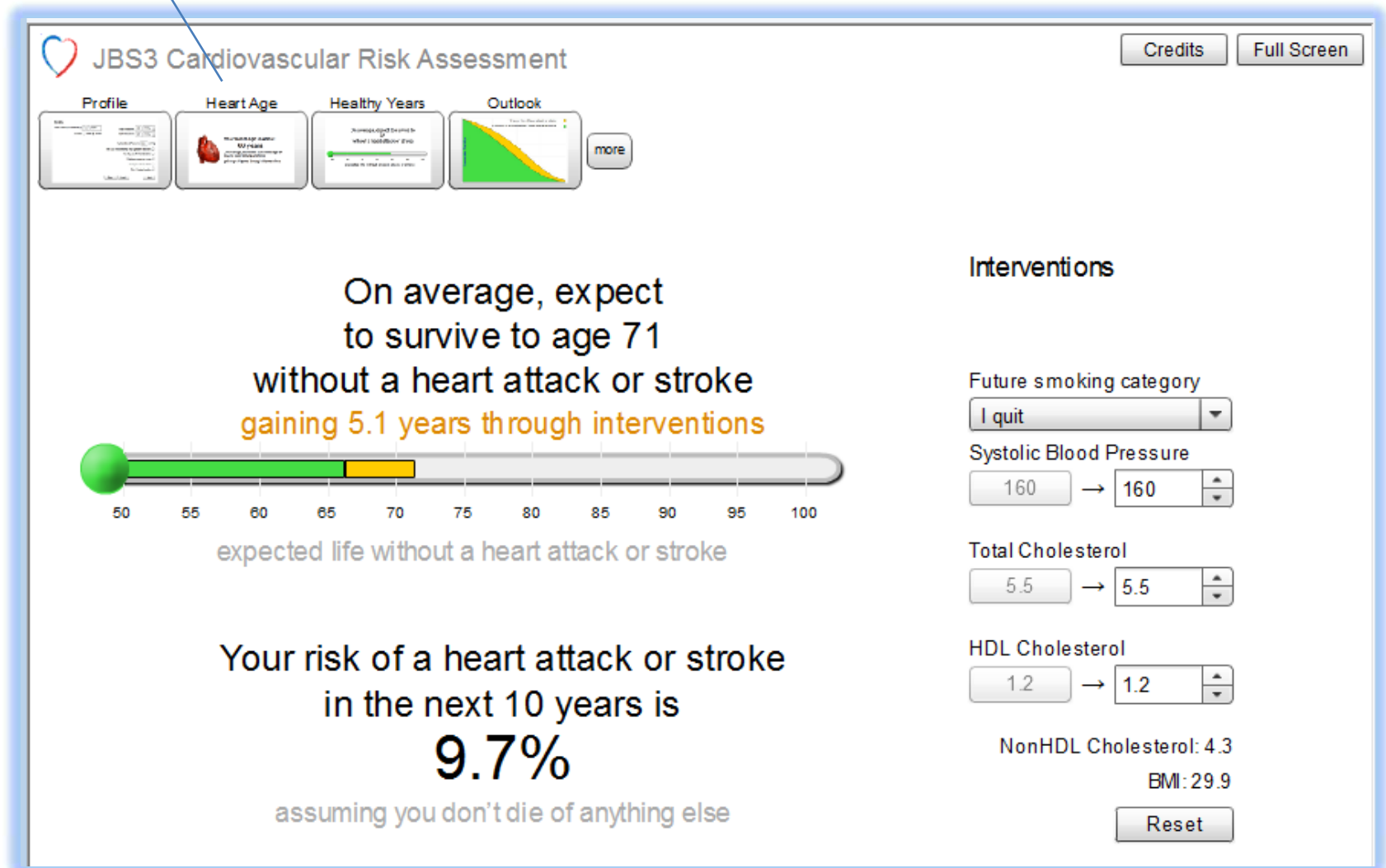


Healthy Years



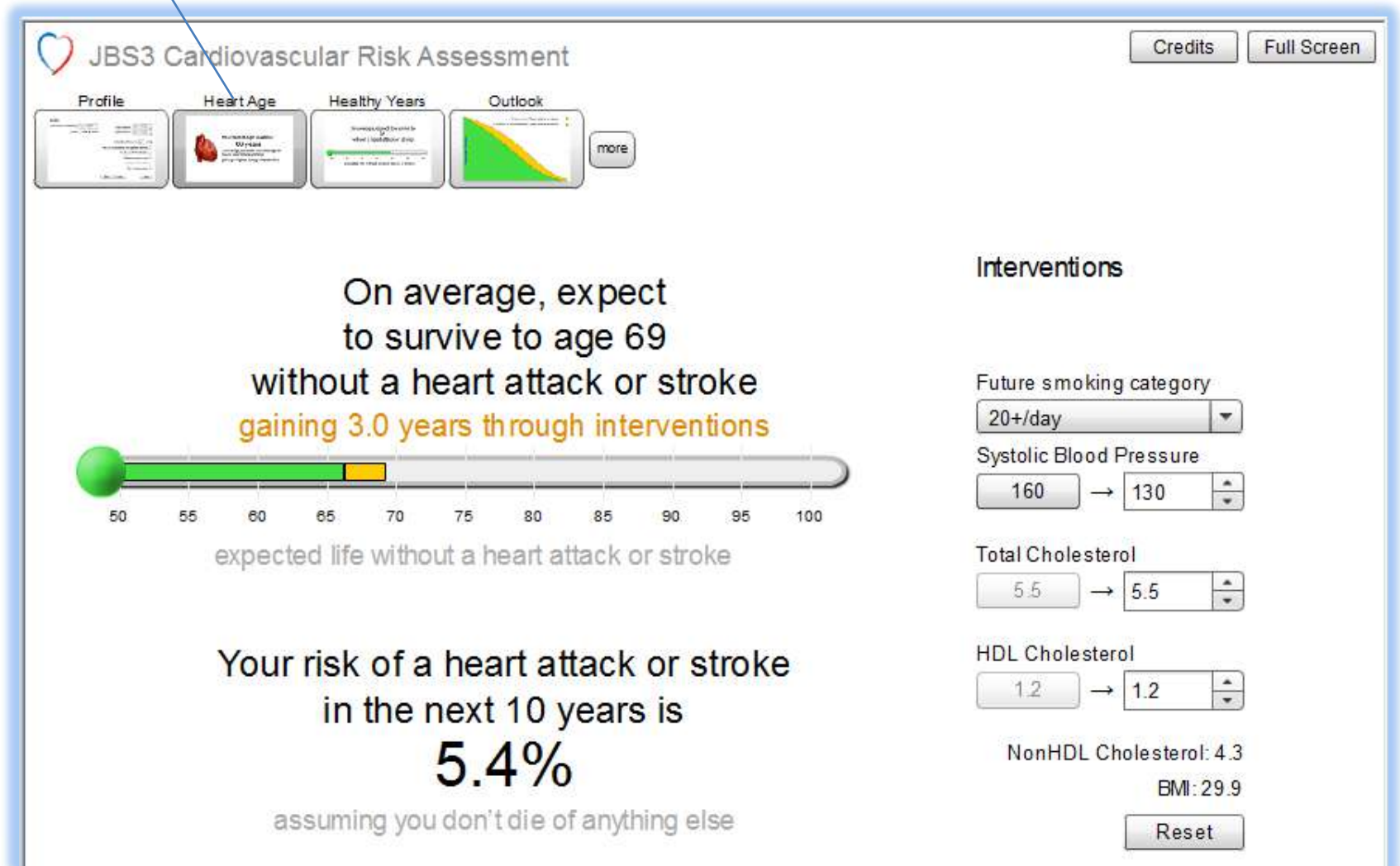
Heart age 68 to 61yrs

Stopping smoking...



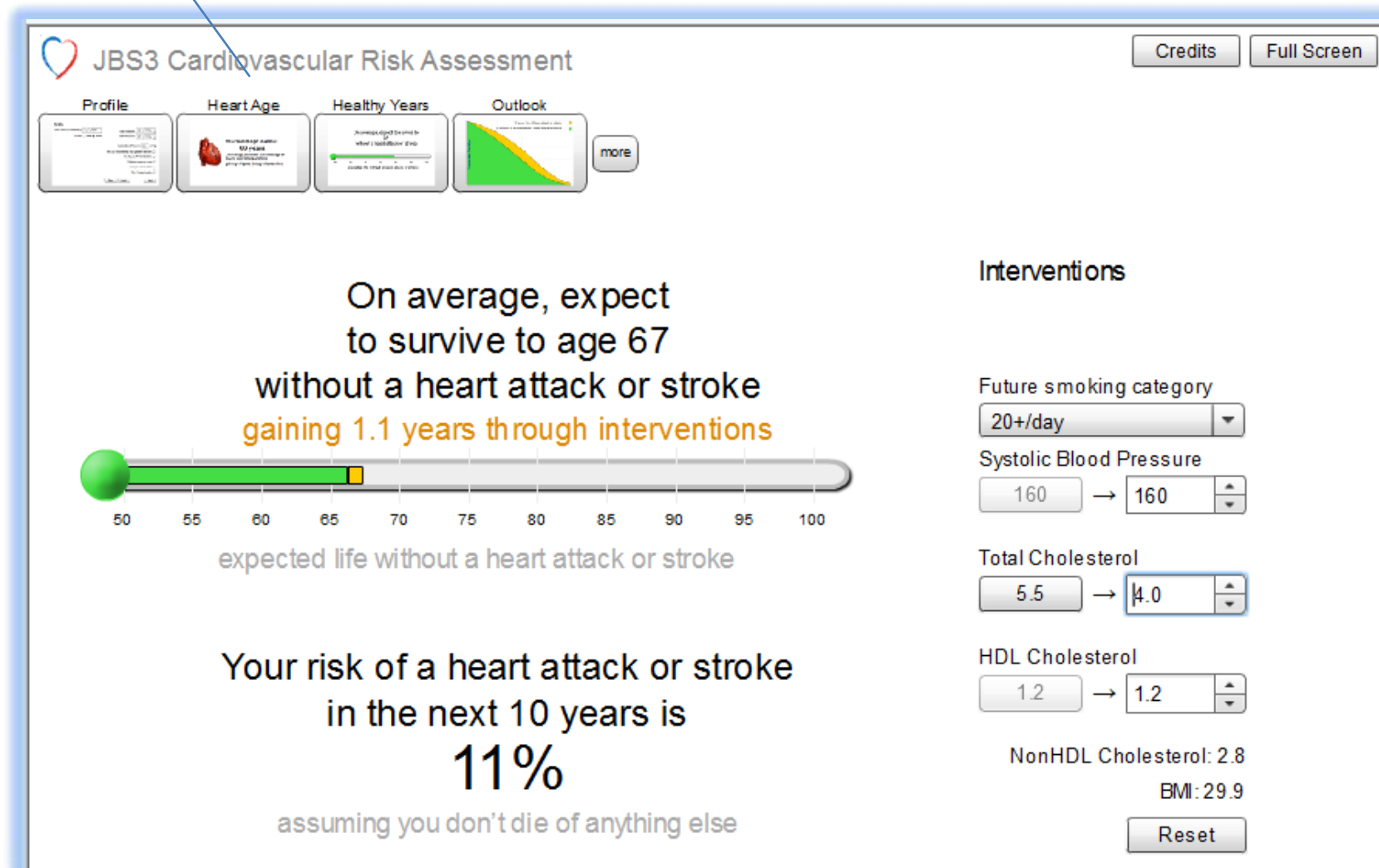
Heart age 68 to 54yrs

Controlling BP...



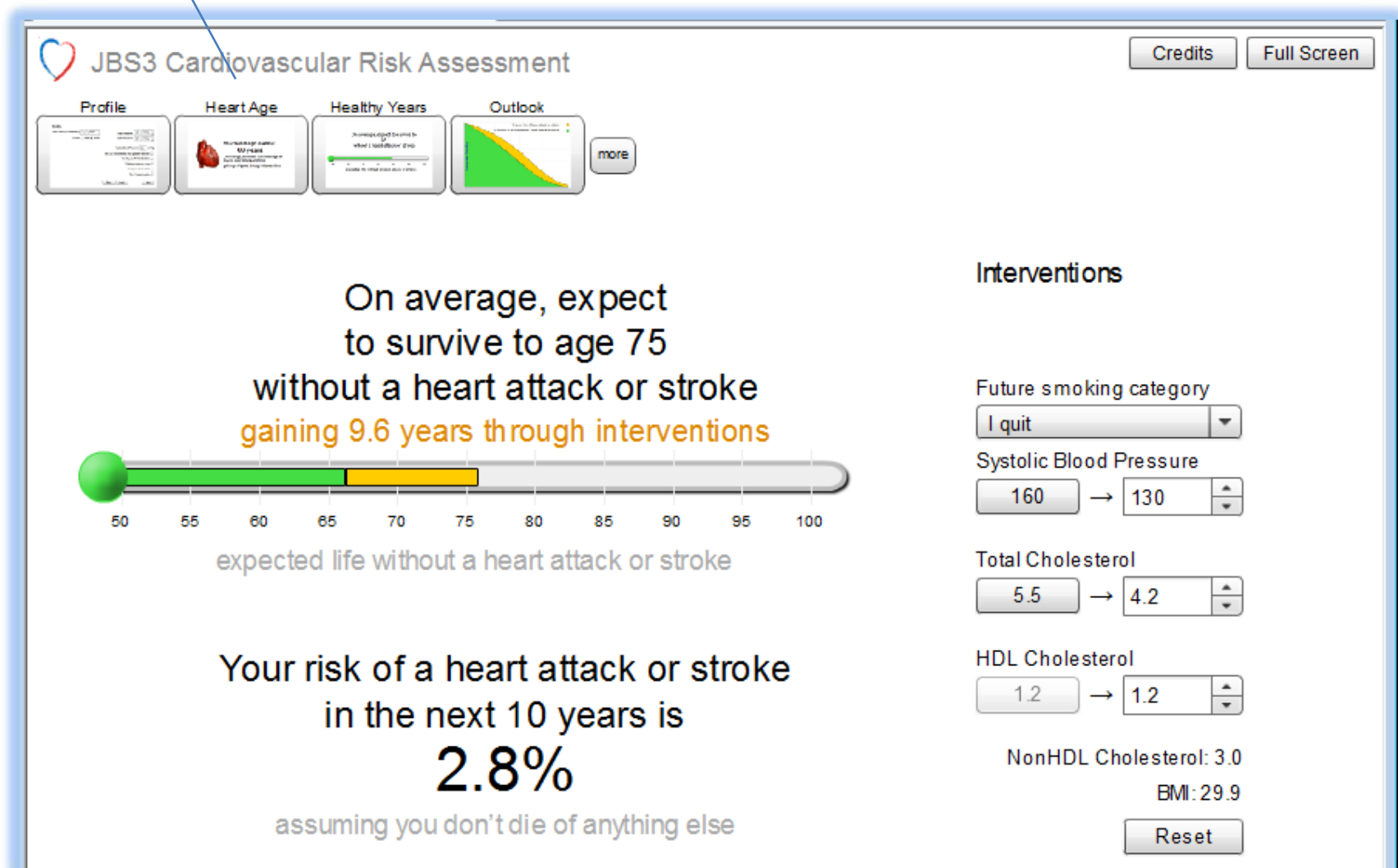
Heart age 68 to 62yrs

Reducing Cholesterol...



Heart age 68 to 47yrs

The full monty.....



Case Histories

- 1. Female 50yrs, Type 2, Smokes 20+, BMI 30
 - Cholesterol of 5.1, HDL 2.2
 - JBS3 Heart age of 61yrs, Healthy LE of 71, 10 yr risk 5.6%
 - Stopping smoking
 - JBS3 Heart age of 56yrs, Healthy LE of 77, 10 yr risk 3.6%
 - Using a statin to reduce cholesterol to 3.5...
 - Heart age of 59, Healthy LE improves by 4/12, 10 yr risk 4.5%

Case Histories

- 1. Female 60yrs, Type 2, Never smoked, BMI 22, Hypertensive
 - Cholesterol of 6.9, HDL 3.0
 - JBS3 Heart age of 68 yrs, Healthy LE of 80yrs, 10 yr risk of 8.5%
 - Benefits of reduction of cholesterol to 5.0 would be a gain of 0.8 of a year of healthy life expectancy. Patient declined
 - “At least I have lived longer than Mum”.
 - Add in FHx of CVD under 60 in a close relative...
 - JBS3 Heart age of 75, Healthy LE of 79, 10 year risk now 14%. Statin accepted

What about the grey zone?

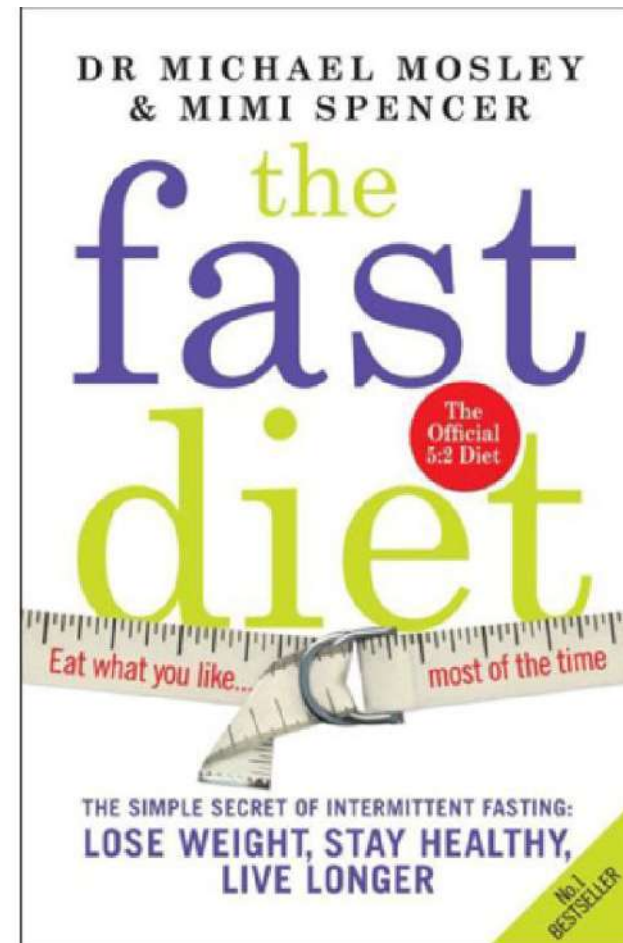
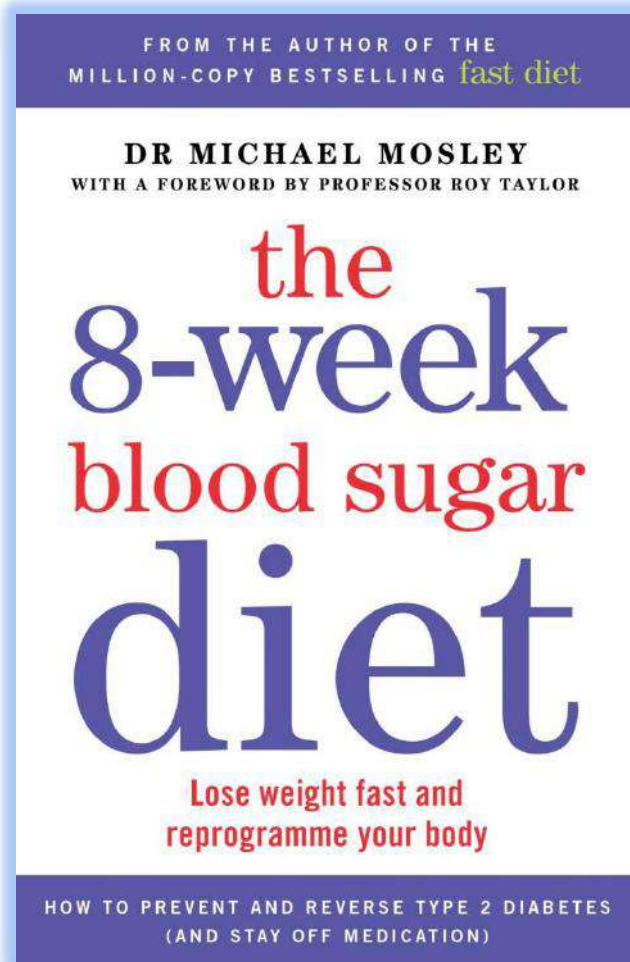
- Male aged 50 with a Cholesterol of 7.5 and no other risk factors
 - JBS3 heart age of 60, Healthy LE 76 and 10 yr risk of 8.7%
 - No FHx, no tendon xanthomata, doesn't meet the Simon Broome Criteria for Familial Hyperchoesterolaemia...
 - 2 lab tests can help in weighing up the decision...
 - hsCRP – need to know no other inflammation – if High suggestive of significant CV risk
 - Lipoprotein (a) if over 300 suggests genetic risk factors are present

Diet, fats and turning the Supertanker

BMJ April 2016

- We know swapping saturated fat for polyunsaturates reduces cholesterol....BUT....
- It does not seem to reduce mortality from heart disease...
- In fact mortality was increased amongst older patients in the intervention group.
- USA – have now removed dietary cholesterol and total fat as risk factors worth worrying about.
- UK advice is still “consume less than 10% of calories from saturated fat”
- Actually – the real problem is carbohydrates.
- **Eat less CHO** – remember it turns to sugar and be relaxed about taking a greater proportion from fats and protein.

For the right patients...



Local initiatives to watch for..

- FreeStyle Libre



Local initiatives to watch for..

- PREVENT – for patients at risk of diabetes
 - Hba1c 42-48 mmol/mol
 - See email dated 14th September 2017 “NDPP Healthier You (Diabetes)” for details.
- DESMOND structured education
 - See email dated 20th December 2017 “Additional funding – referring patients to DESMOND” with full details of how to refer including self referral and payment details.
- The New LCS for diabetes
 - Will follow the NDA in rewarding for the 8 care processes.
Bonus for all 8 + % to 3 targets +insulin + GLP initiation

Ideas for Audit and QIA

- Find your patients “At risk of diabetes” – do they even know? Refer to PREVENT.
- What is happening to the mass of your diabetic population? Intervene and see if there is a difference.
- Check out, shortcut and use JBS3.
- Have all your patients with Type 2 been offered DESMOND?
- Check you have no-one on metformin with an eGFR less than 30, reduce the dose in patients with eGFR less than 40.
- Review your patients on pioglitazone – consider other options
- Read up and consider actually recommending a diet plan.
- Revise Simon Broome criteria for FH, and consider using hsCRP and Lp(a).