

HIDDEN DIABETES

The symptoms you might miss

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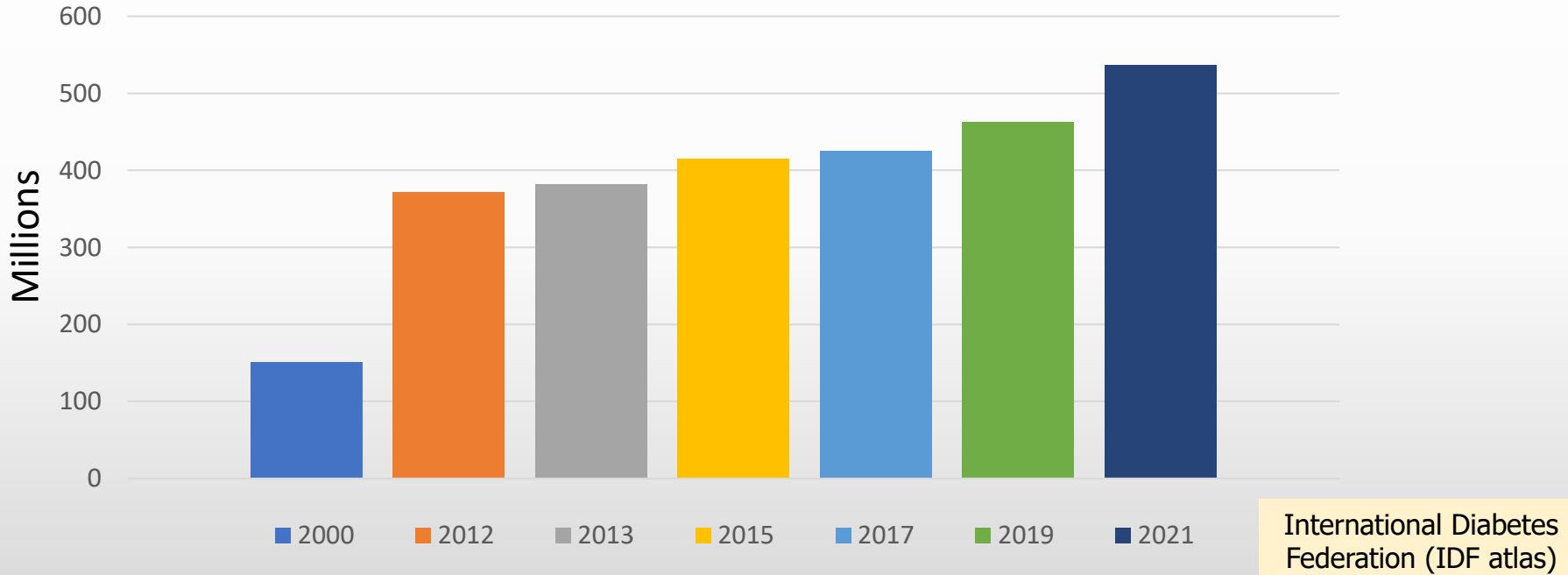
Key Messages

- 537M people aged 20-79 live with diabetes – 10.5% of the worlds population
- This is **estimated to rise to 643M (11.3%) by 2030** and 783M (12.2%) by 2045
- 240M (**44.6%** of everyone) **do not know** they have diabetes
- 90% of undiagnosed diabetes is in Low and Middle Income countries
- 1.2M children and young people have T1DM, most are under 15

www.diabetesatlas.org

Prevalence – How Many People Have it?

Diabetes Estimations (in millions of people, aged 20-79)



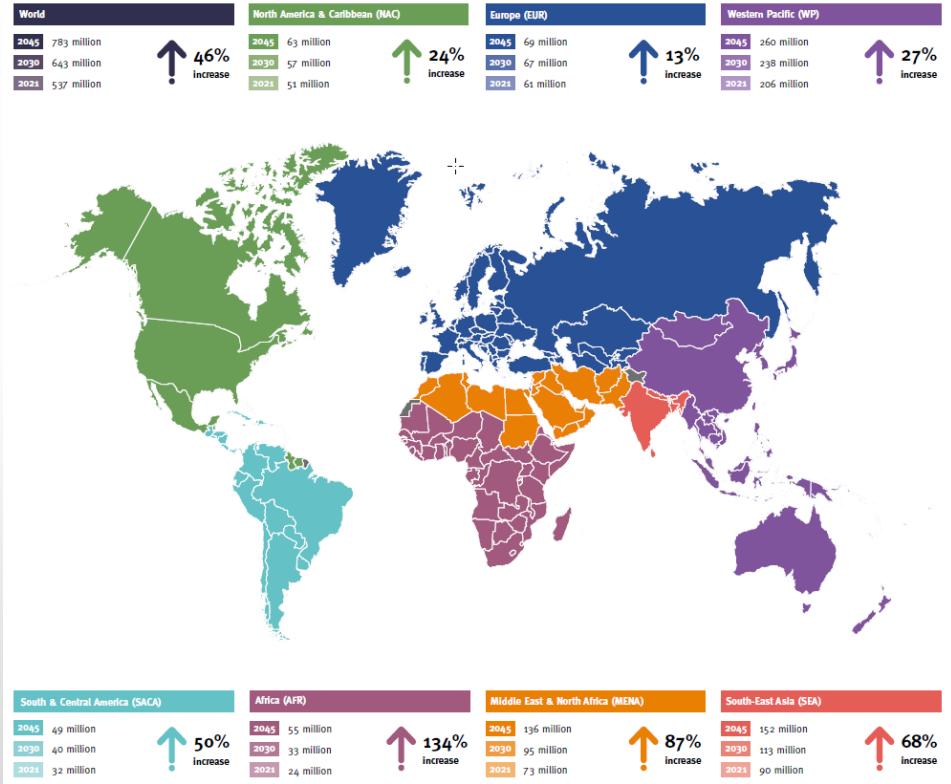
Prevalence – How Many People Have it?

IDF atlas estimations (in millions of people, aged 20-79):

- 2000 – 151M
- 2012 – 371M (8.3%)
- 2013 – 382M (8.3%) (est. at 592M by 2035 [10.1%])
- 2015 – 415M (8.8%) (est. at 642M by 2040 [10.4%])
- 2017 – 425M (8.8%) (est. at 629M by 2045 [9.9%])
- 2019 – 463M (9.3%) (est. at 579M by 2030 [10.2%]; 701M [10.9%]) by 2045
- 2021 – 537M (10.5%) (est. at 643M by 2030 [11.3%]; 783M [12.2%] by 2045)

International Diabetes
Federation (IDF atlas)

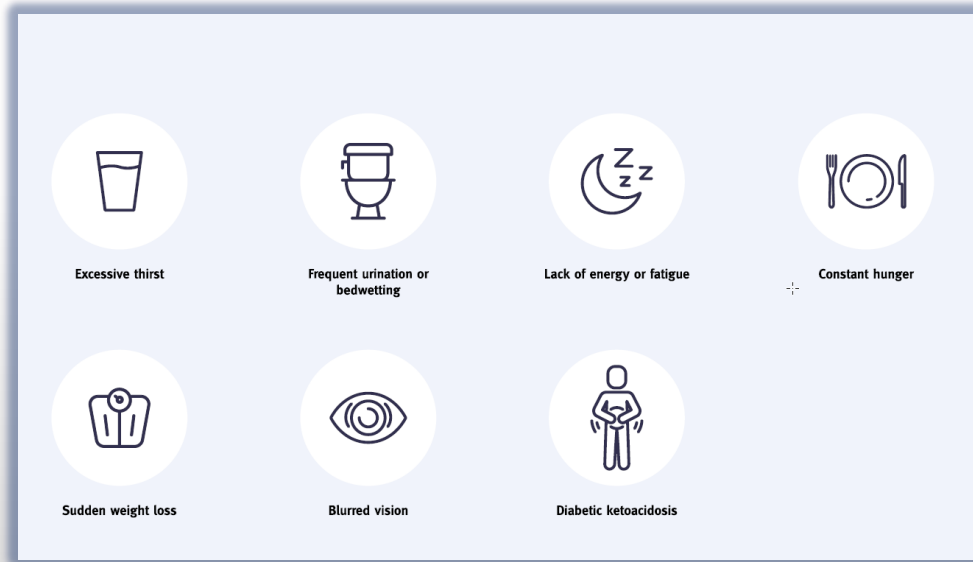
Where Are They All?



International Diabetes Federation (IDF atlas)

What is it? Symptoms?

- A long term ('chronic') condition, defined by the presence of high blood glucose concentrations



Different Types

- **Type 1** – where the body destroys the insulin producing cells
- **Type 2** – usually related to being overweight or obese – strongly genetically related
- **Gestational diabetes** – diabetes occurring for the first time during pregnancy

Other Types

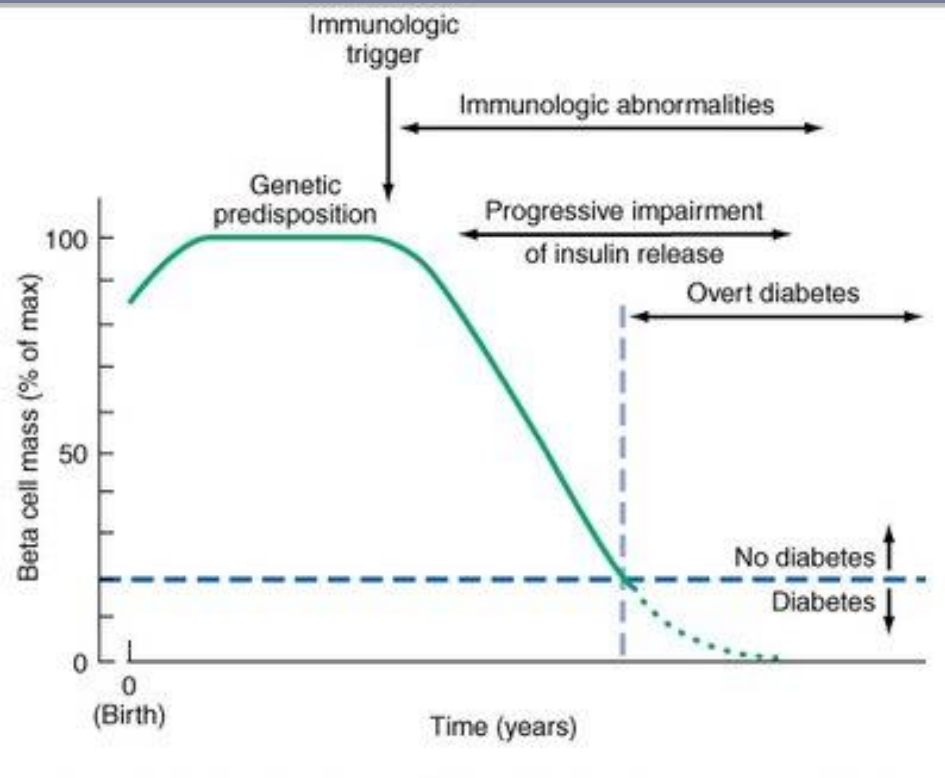
- Pancreatic disease related
- Diseases that antagonise insulin action – e.g. Cushing's syndrome
- Drugs that stop insulin working – e.g. steroids
- Infections – e.g. (??COVID)
- Uncommon forms of immune system diseases
- Genetic syndromes, e.g. Down's syndrome

Type 1 Diabetes – What Causes it?

- No idea!
- An interaction between genes and environment

Type 1 – risk factors

- Beta cells are what produce insulin in the pancreas



Is Type 1 Diabetes Preventable?

- Not at the moment - But lots of people are doing work on trying to modulate the immune system

- No luck as yet

Type 1 – Treatment

INSULIN AND DIABETES.

A GENERAL STATEMENT OF THE PHYSIOLOGICAL AND THERAPEUTIC EFFECTS OF INSULIN.

BY

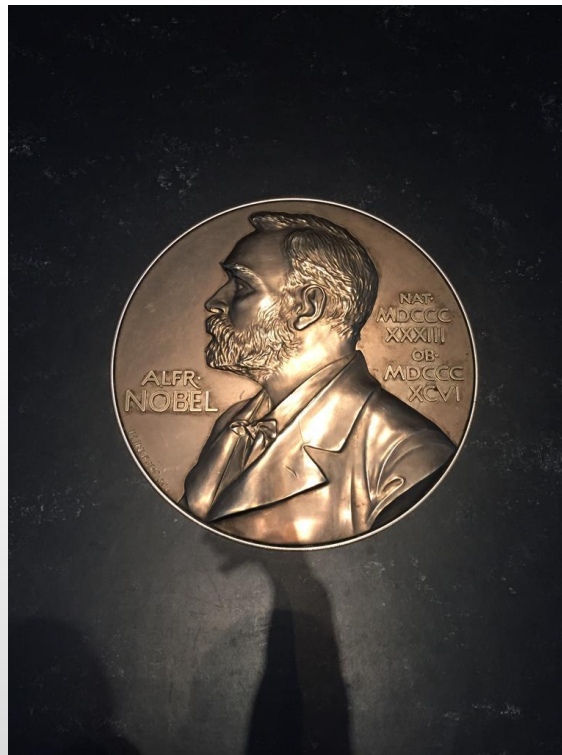
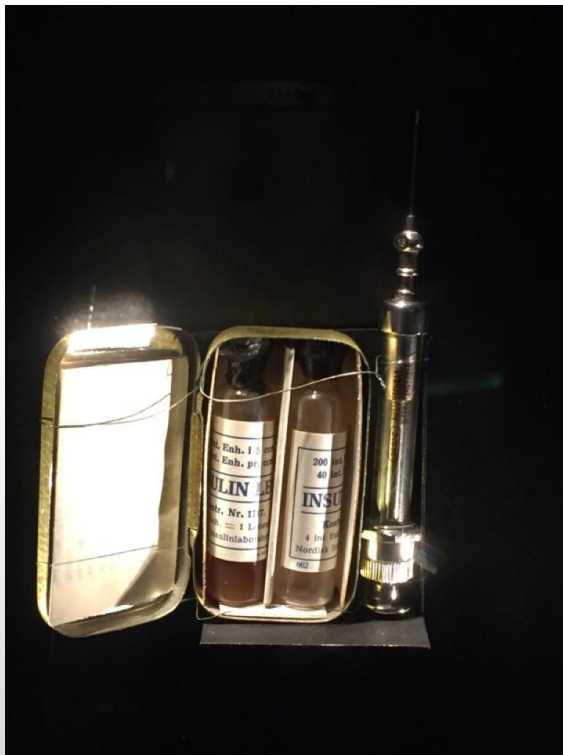
J. J. R. MACLEOD, M.B., CH.B. ABERD.,
PROFESSOR OF PHYSIOLOGY, TORONTO UNIVERSITY.

Early Investigations.



JJR MacLeod BMJ 1922;2:833-835

Reward – The 1923 Nobel Prize



Type 2 – Risk Factors

Body Mass Index	Age-Adjusted Relative Risk (95% CI)
<i>kg/m²</i>	
>22.0	1.0 (reference)
22.0–22.9	2.9 (2.0 to 4.1)
23.0–23.9	4.3 (3.1 to 5.8)
24.0–24.9	5.0 (3.6 to 6.6)
25.0–26.9	8.1 (6.2 to 10.5)
27.0–28.9	15.8 (12.7 to 19.8)
29.0–30.9	27.6 (22.7 to 33.5)
31.0–32.9	40.3 (33.7 to 48.3)
33.0–34.9	54.0 (45.6 to 64.0)
≥35.0	93.2 (81.4 to 106.6)

$$\text{BMI} = \frac{\text{Weight (kg)}^2}{\text{Height (m)}^2}$$

Colditz GA et al Ann Int Med 1995;122(7):481-486

Type 2 – Other Risk Factors

- Family History
- Personal history of gestational diabetes
- Use of medications that stop insulin working
- Being aged over 40
- Being of South Asian ancestry

Complications We Are Trying to Prevent

- Premature death!

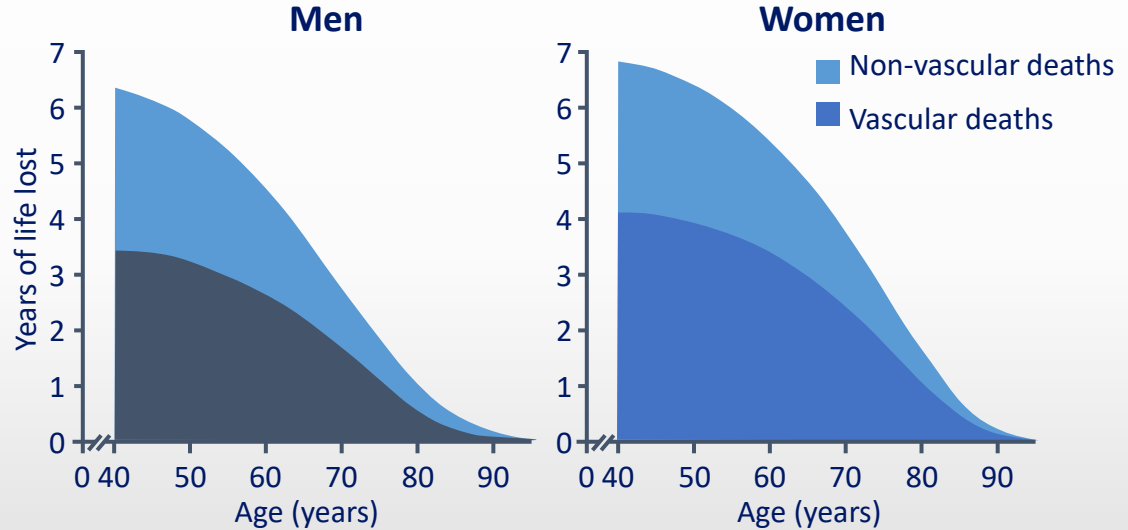
Years of life lost in people with diabetes compared with non-diabetes peers

- 'Big' blood vessel disease

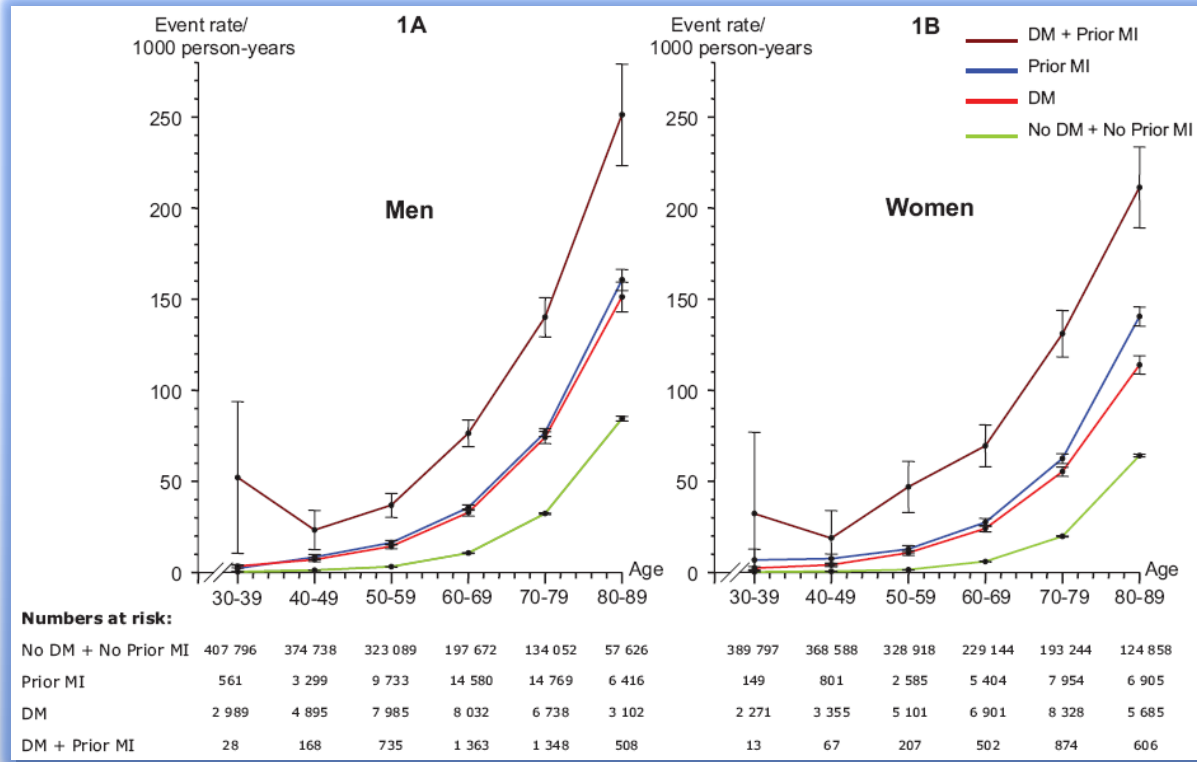
- Strokes
- Heart attacks

- 'Small' blood vessel disease

- Eyes
- Kidney's
- Nerves

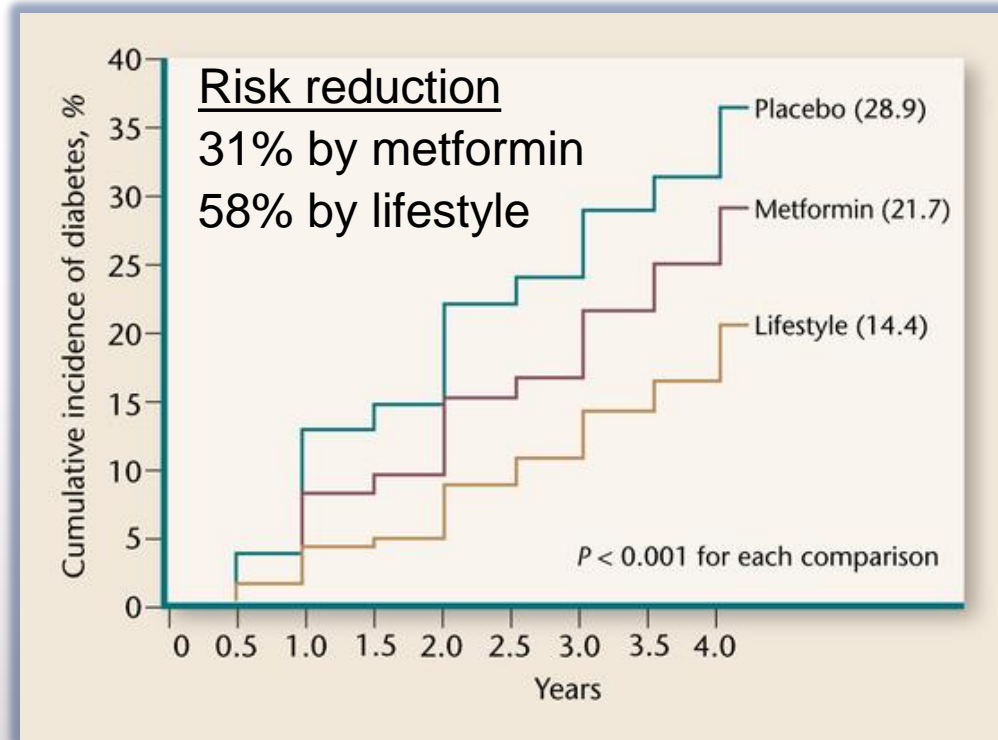


Diabetes is not 'Mild' - Data From 3.3M Danes



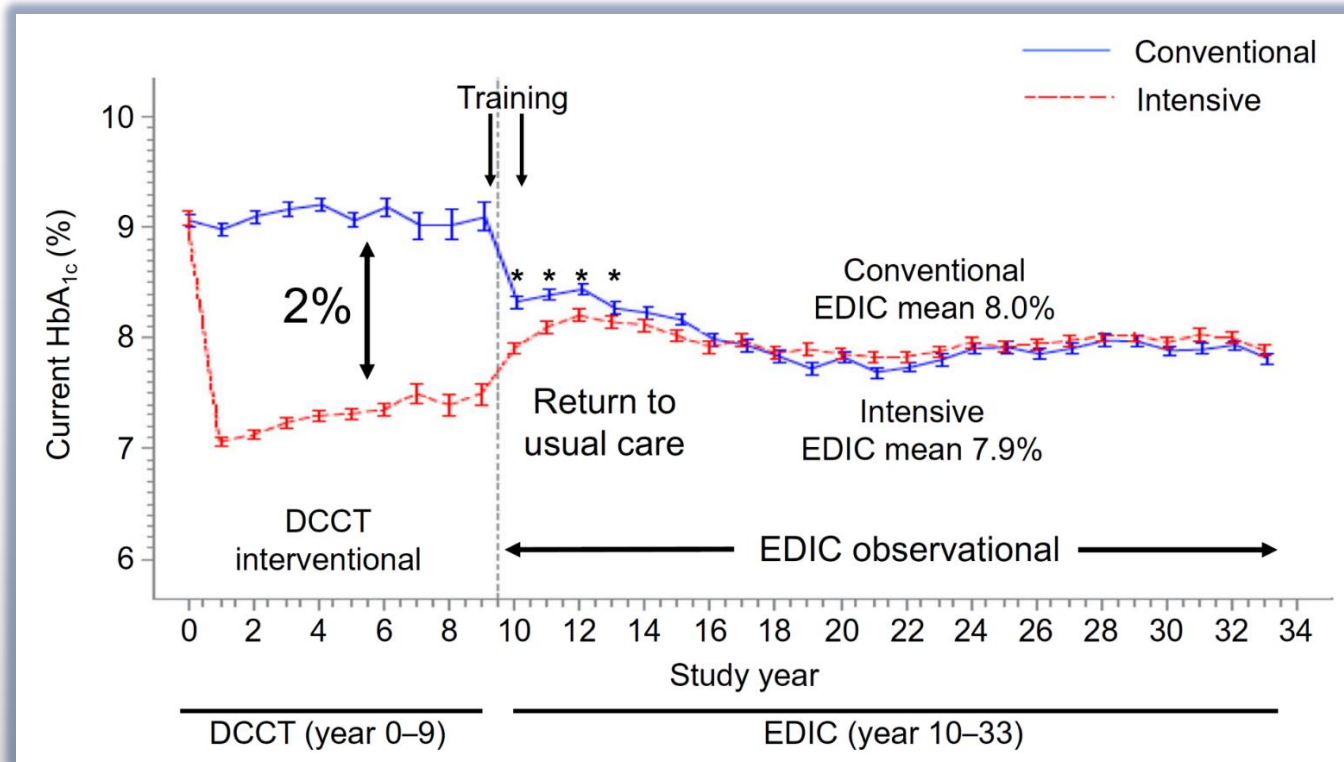
Schramm TK et al Circulation 2008;117:1945-1954

Prevention - The Benefits of Weight Loss and Exercise



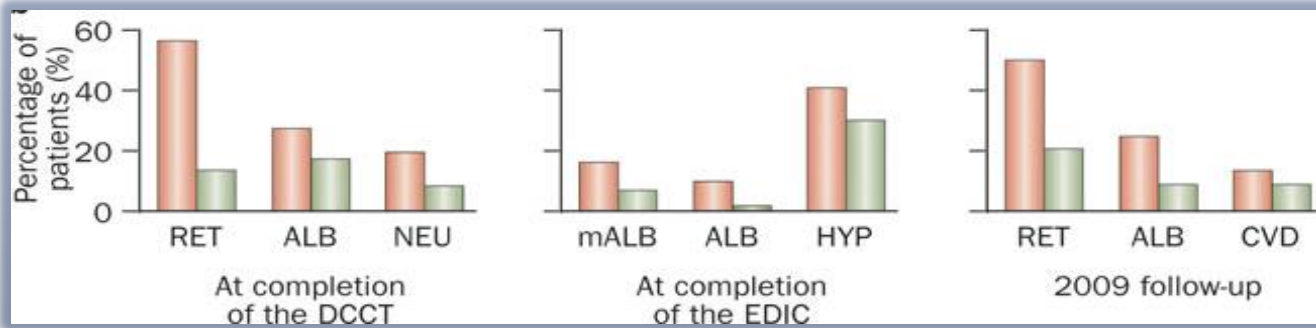
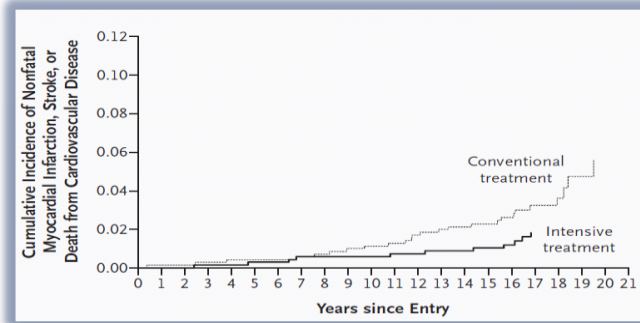
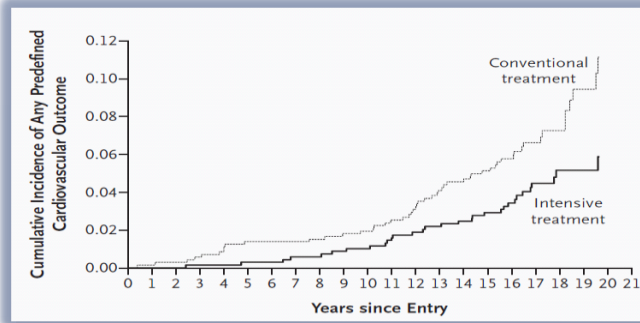
The DPP Research Group, NEJM 2002;346:393-403

Early, Aggressive Treatment is Vital – Type 1



DCCT Research Group NEJM 1993;329(14):977-986

Early, Aggressive Treatment is Vital – Type 1



The risk of developing eye disease was reduced by 75% and progression of eye disease slowed by 54%

DCCT/EDIC Study Group NEJM 2005;353(25):2643-2653
Pirola L et al. Nat Rev Endocrinol 2010;6(12):665-675

Type 2 Diabetes

- Early 'tight' glucose control significantly reduced the risks of developing complications – even after 44 years of diagnosis

A Calorie Calculation (for men).....

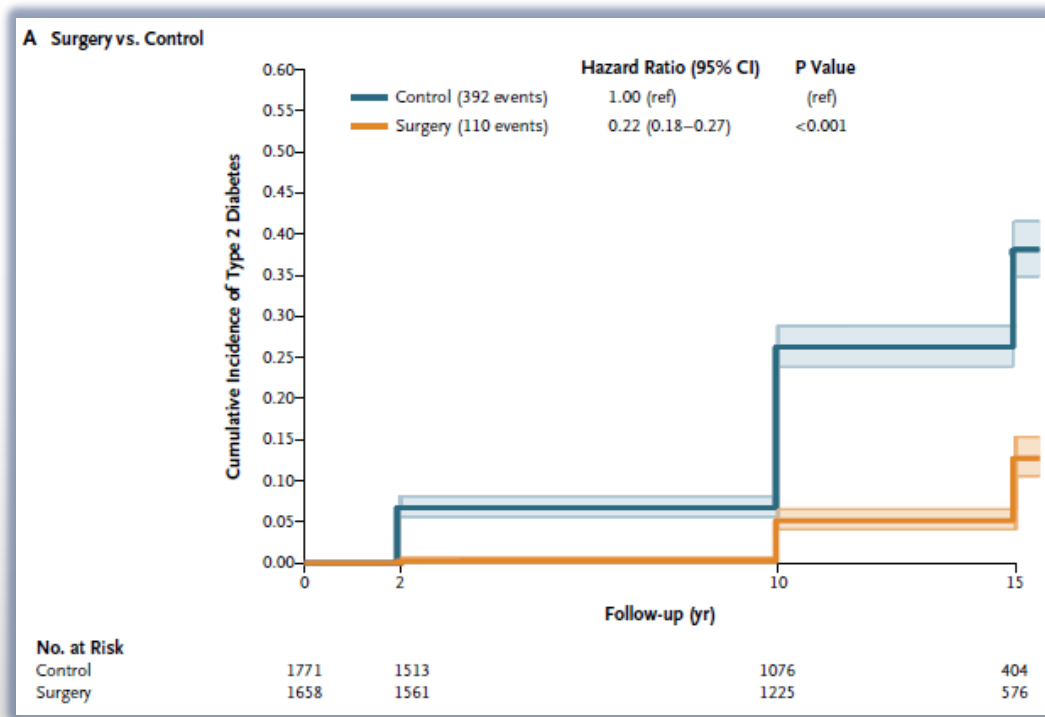
- Average calorie requirement for a man per 24h = 2,500
- Over 365 days = $2,500 \times 365 = 912,500$
- Let's say, over the course of a year you do 0.5% less and you eat 0.5% more
- That equals 1% or 9,125 calories overeaten / not expended
- 1Kg of fat contains 9,000 calories

- The bad news is over time, you need fewer calories to stay the same weight

T2 - Treatments

- 9 different classes of medication used to treat diabetes
- Often used in combination
- Newer classes have shown highly significant benefits in reducing the risks of heart attacks and strokes, and other complications of diabetes

What About Surgery?



88% relative risk reduction in the risk of developing diabetes 15 years after weight loss surgery

Carlsson LM et al NEJM 2012;367(8):695-704

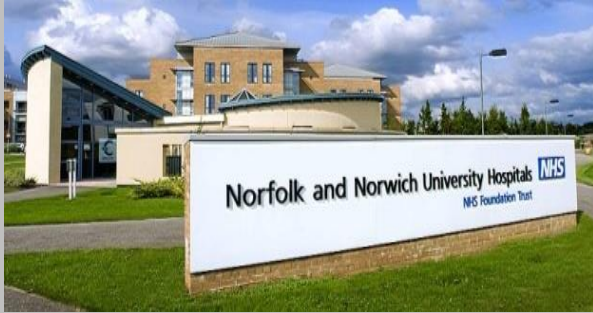
What Can You Do?

- If you want to stay well – stop smoking
- If you want to reduce the risk of getting diabetes – eat less, do more
- If you have it – take every tablet/injections every day and make sure you go to every appointment
- Above all – choose your parents carefully



Hidden Diabetes

The symptoms you might miss

www.norfolkdiabetes.com



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