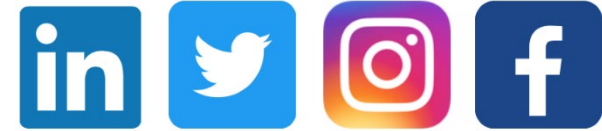




# Lifestyle Medicine: For Diabetes

Dr Nerys Frater  
[www.thelifestyleclinic.co.uk](http://www.thelifestyleclinic.co.uk)



**DIABETES UK**  
KNOW DIABETES. FIGHT DIABETES.



**GIG  
CYMRU  
NHS  
WALES**

Bwrdd Iechyd Prifysgol  
Hywel Dda  
University Health Board

# Lifestyle advice & social prescribing

Effects of nutrition, physical activity, sleep and stress on type 2 diabetes:  
latest evidence

The new ADA/EASD guidance

What to cover in consultations

30 mins

# The Six Pillars of Lifestyle Medicine



Healthy Eating



Mental Wellbeing



Healthy Relationships



Physical Activity





Minimising Harmful Substances



Sleep

# ADA/ EASD guidelines

		Glucose/insulin	Blood pressure	HbA <sub>1c</sub>	Lipids	Physical function	Depression	Quality of life
	SITTING/BREAKING UP PROLONGED SITTING	↓	↓	↓	↓	↑	↓	↑
	STEPPING	↓	↓	↓	↓	↑	↓	↑
	SWEATING (MODERATE-TO-VIGOROUS ACTIVITY)	↓	↓	↓	↓	↑	↓	↑
	STRENGTHENING	↓	↓	↓	↓	↑	↓	↑
	ADEQUATE SLEEP DURATION	↓	↓	↓	↓	?	↓	↑
	GOOD SLEEP QUALITY	↓	↓	↓	↓	?	↓	↑
	CHRONOTYPE/CONSISTENT TIMING	↓	?	↓	?	?	↓	?

## IMPACT OF PHYSICAL BEHAVIOURS ON CARDIOMETABOLIC HEALTH IN PEOPLE WITH TYPE 2 DIABETES

↑ Higher levels/improvement (physical function, quality of life); ↓ Lower levels/improvement (glucose/insulin, blood pressure, HbA<sub>1c</sub>, lipids, depression); ? no data available;  
 ↑ Green arrows = strong evidence; ↑ Yellow arrows = medium strength evidence; ↑ Red arrows = limited evidence.



# Who am I?



- GP Partner
- PG Dip Obesity & Weight Management (Dist)
- BSLM
- Diabetes UK Clinical Champion 21-23

# The Lifestyle Clinic



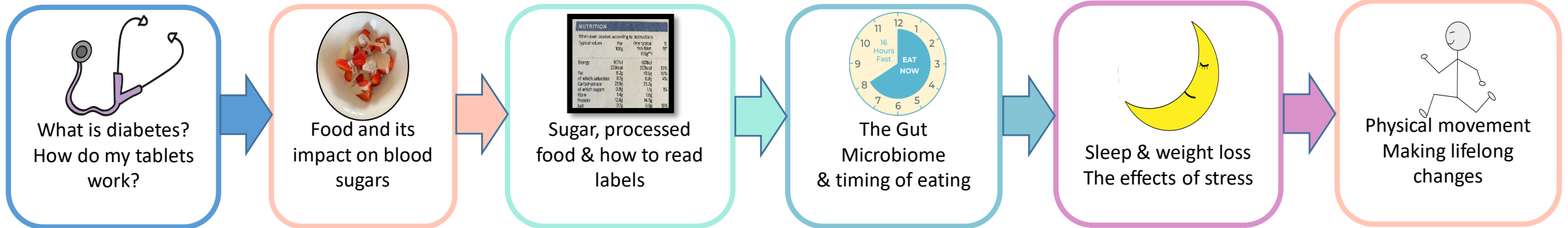
Weight Loss Clinic



Prediabetes Clinic



Diabetes Clinic



# To Achieving Great Results

## Diabetes Clinic



93%  
lowered their  
blood sugars



56%

of participants with Type 2 Diabetes had  
a **normal** blood sugar after 6months



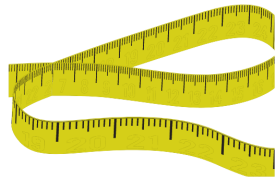
93% maintained or  
increase HDL

87% lowered  
Triglycerides



40%  
had stopped or  
decreased  
medication dose

## Weight Loss



90%  
had decreased  
their waist  
circumference



7Kg  
average weight loss  
(within 6 weeks)



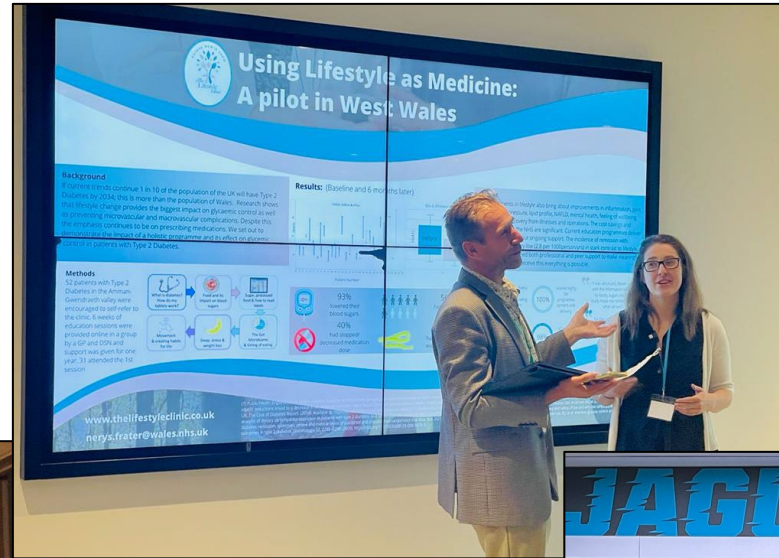
6.1%  
of starting weight lost  
(more than 5% loss has  
significant health benefit)



95%  
of participants felt their  
lifestyle had improved



# What it's really like







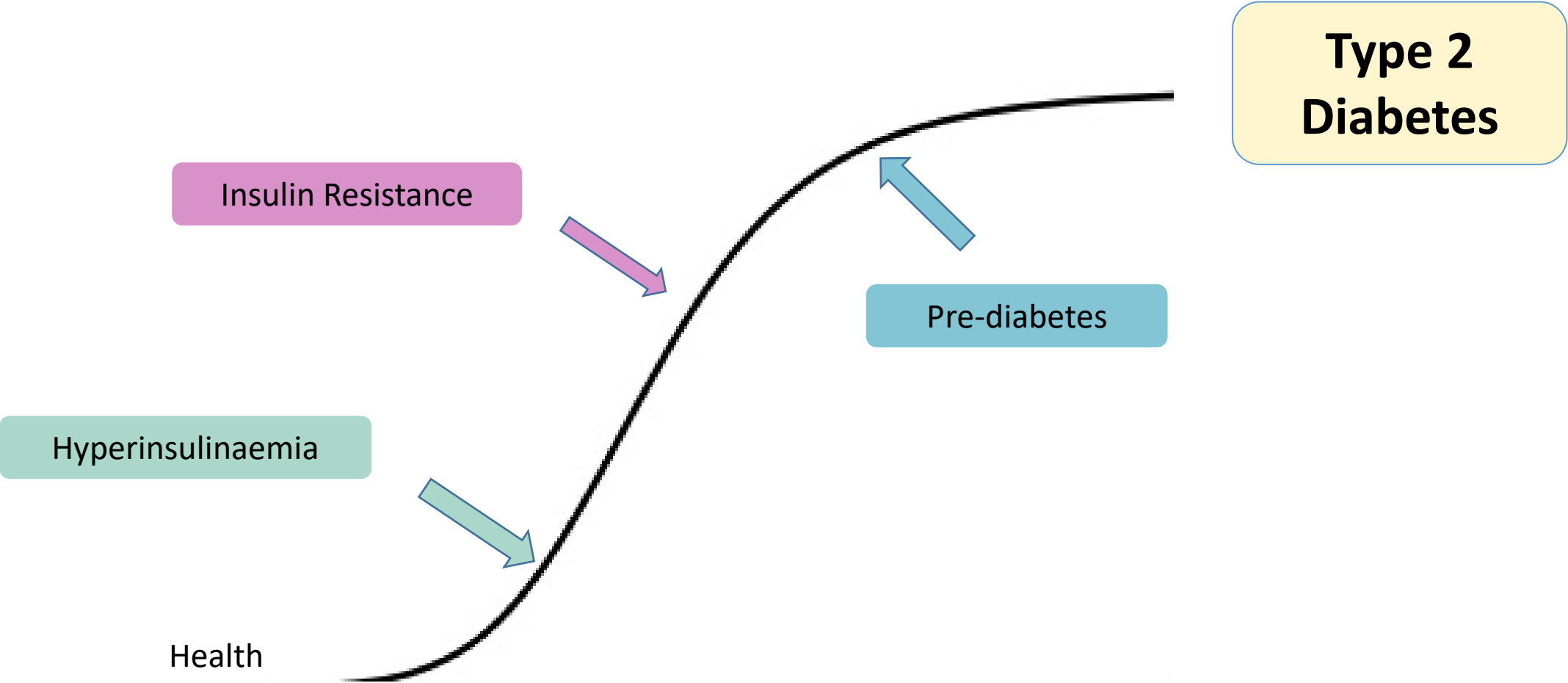
# Obesity is fuelling a rise in Type 2 diabetes



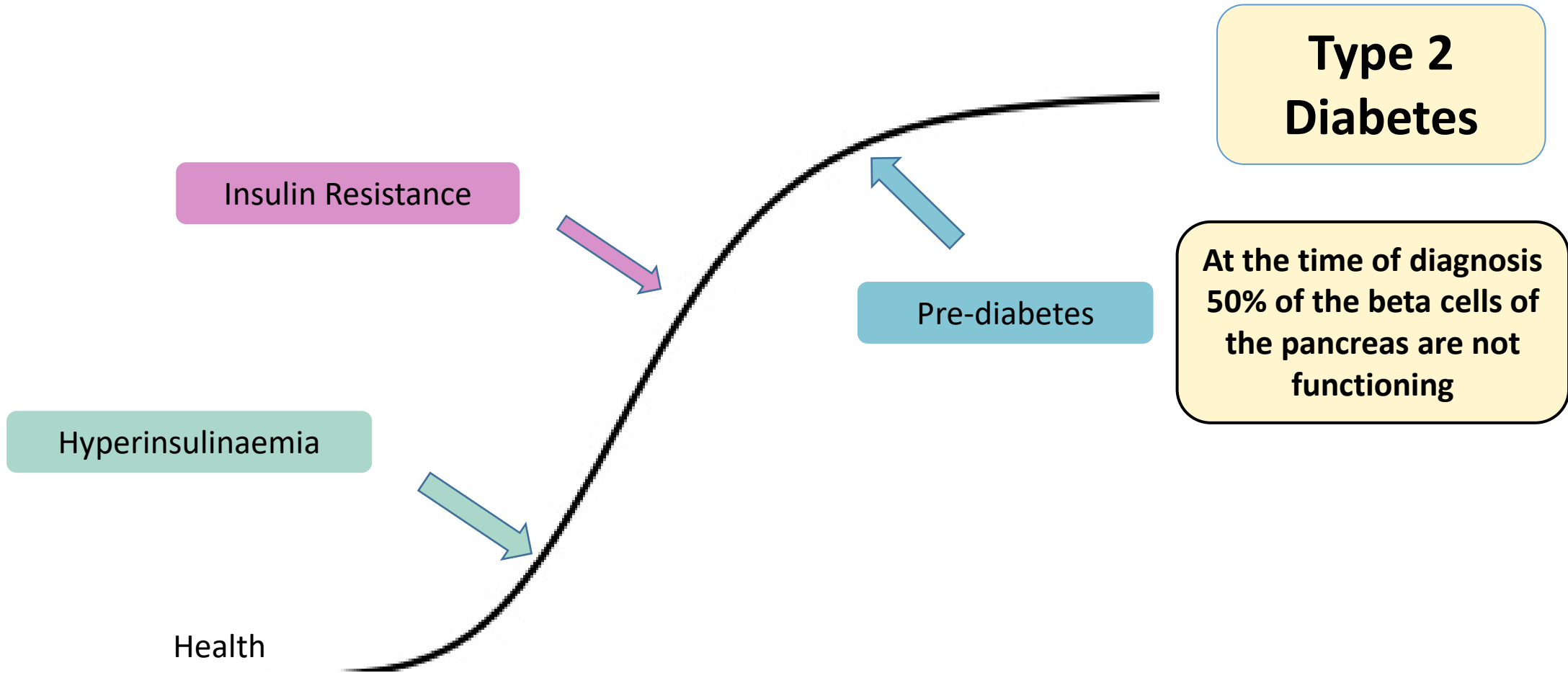
and **1 in 10** will develop Type 2 diabetes



# Health & Disease Curve

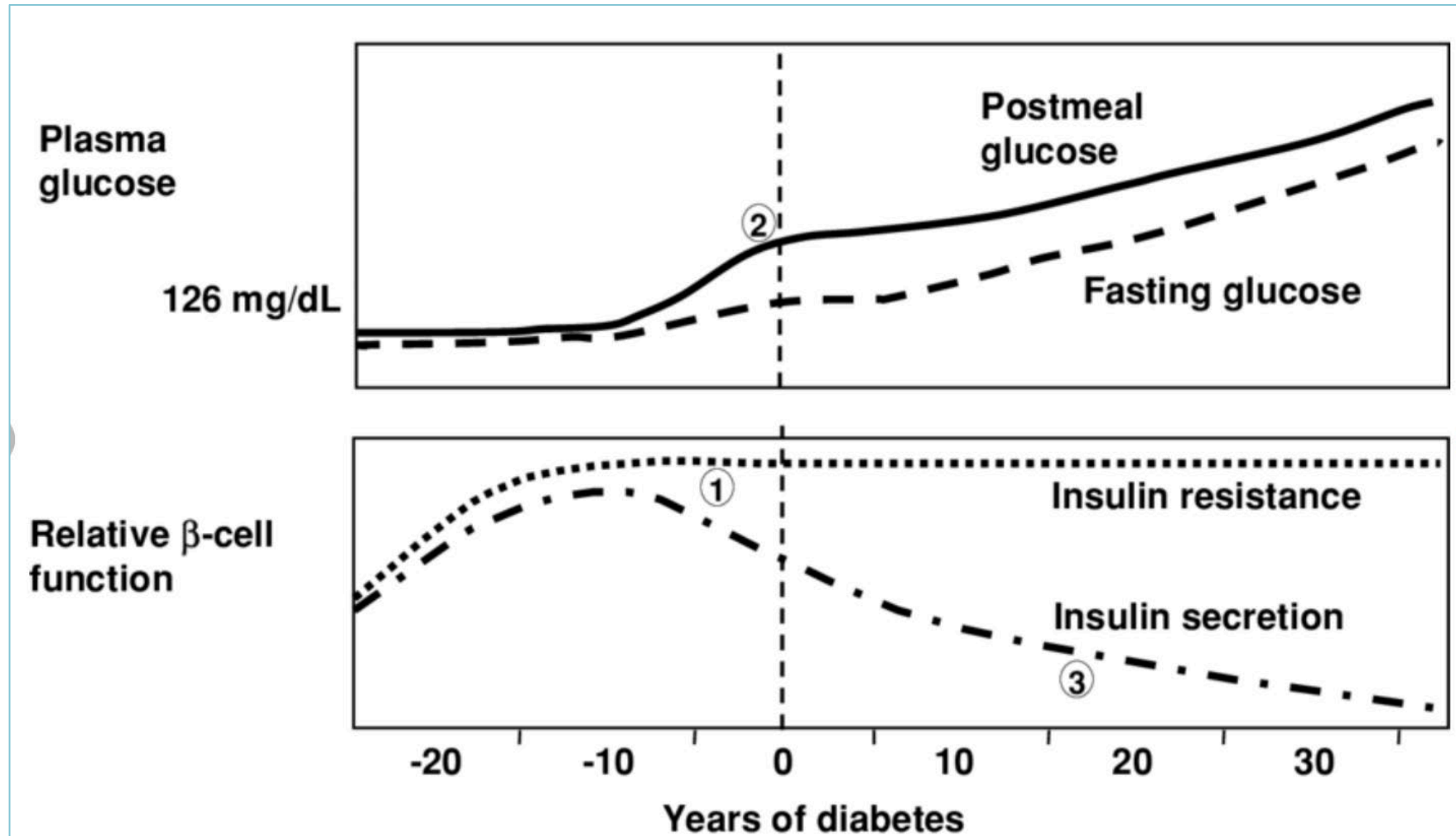


# Health & Disease Curve





# The start of Type 2 Diabetes



# The impact of medication

Medication (as monotherapy)	Expected lowering of HbA1c
Metformin	16 mmol/mol
Sulfonylurea	16 mmol/mol
DPP-4	5-9 mmol/mol
GLP-1	6-12 mmol/mol
Thiazolidinediones	5-15 mmol/mol
SGLT-2	8-11mmol/mol

# The impact of medication Vs Lifestyle

Medication (as monotherapy)	Expected lowering of HbA1c
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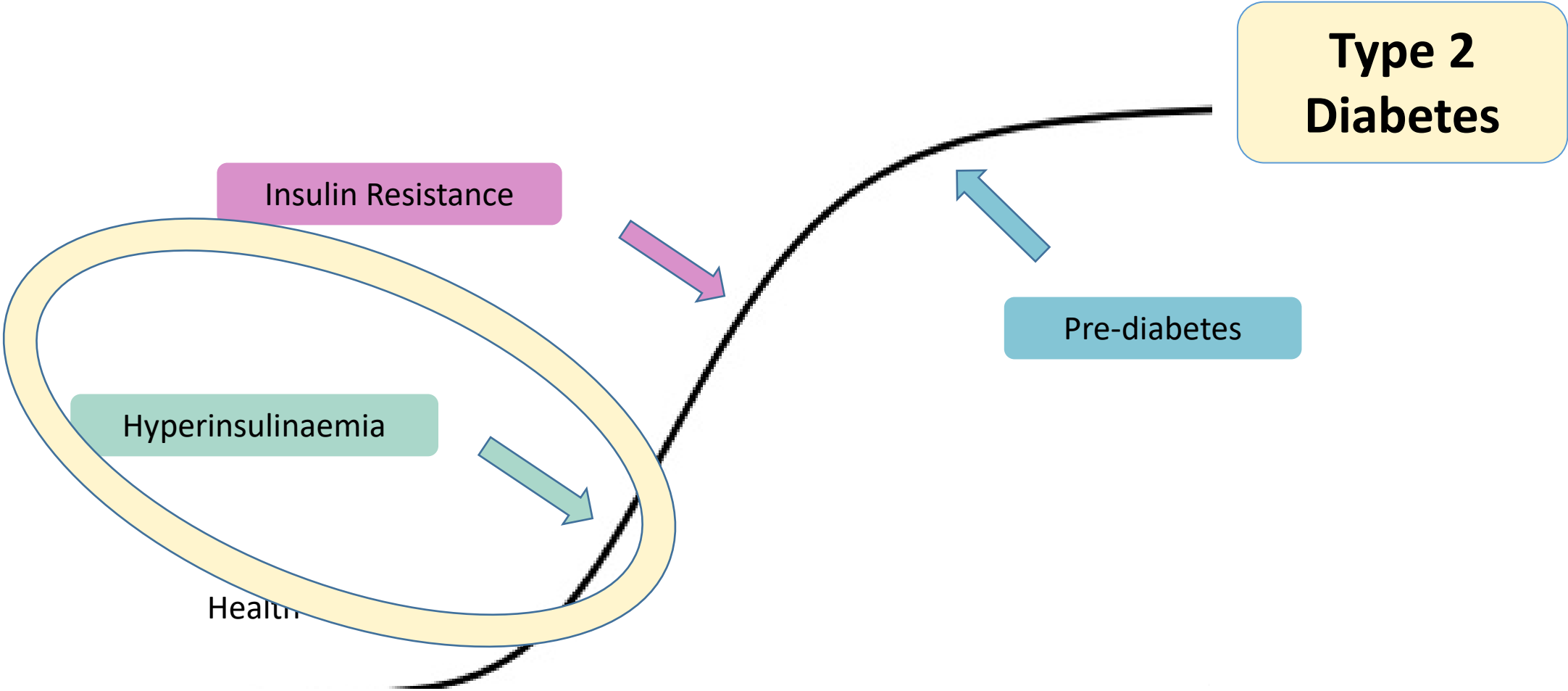
**Best result  
54mmol/mol**



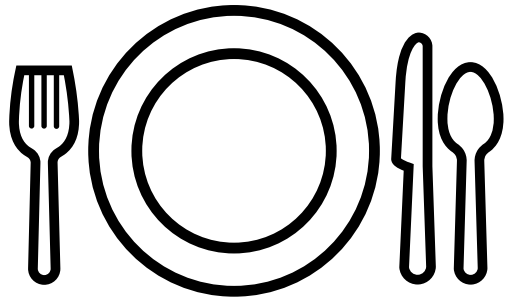
# Complications

The UKPDS trial demonstrated intensive Glucose control using medication (excluding Metformin) did not lead to a reduction in Cardiovascular mortality.

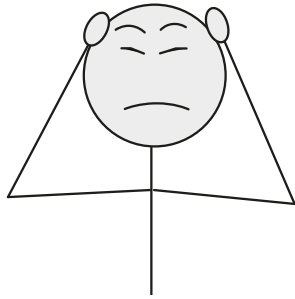
# Health & Disease Curve



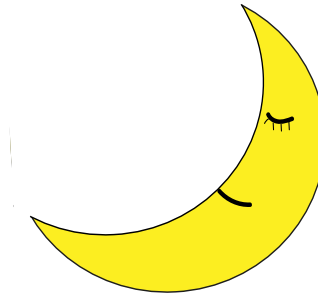
# What causes high insulin?



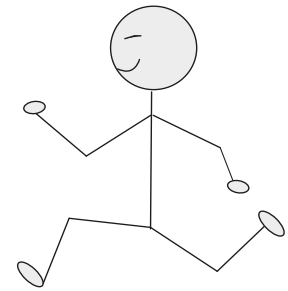
Foods that raise blood glucose



Chronic Stress



Lack of sleep



Sedentary lifestyle



Genetics/Epigenetics

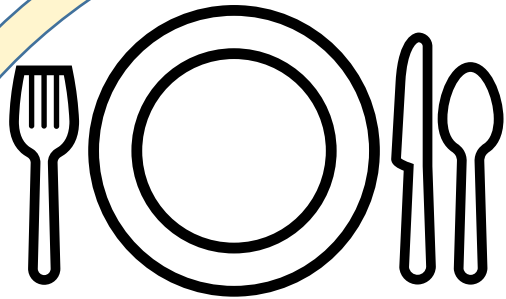


# Genetics & Epigenetics

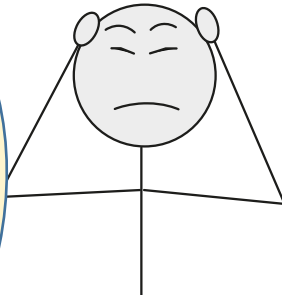
- Heritability of Type 2 Diabetes is thought to be 20-80% <sup>(1)</sup>
- Lifetime risk of developing Diabetes is 40% if 1 parents affected & 70% if both parents affected. <sup>(1)</sup>
- Genetic variants which increase fat storage during periods of energy excess (thrifty genotype) were favoured by evolution in the past
- Genes have changed very little but the environment has changed greatly

**Your genes load the gun but your environment pulls the trigger**

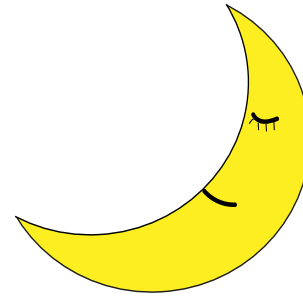
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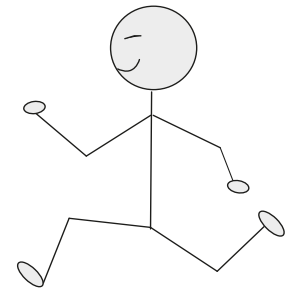
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Chronic Stress



Lack of sleep

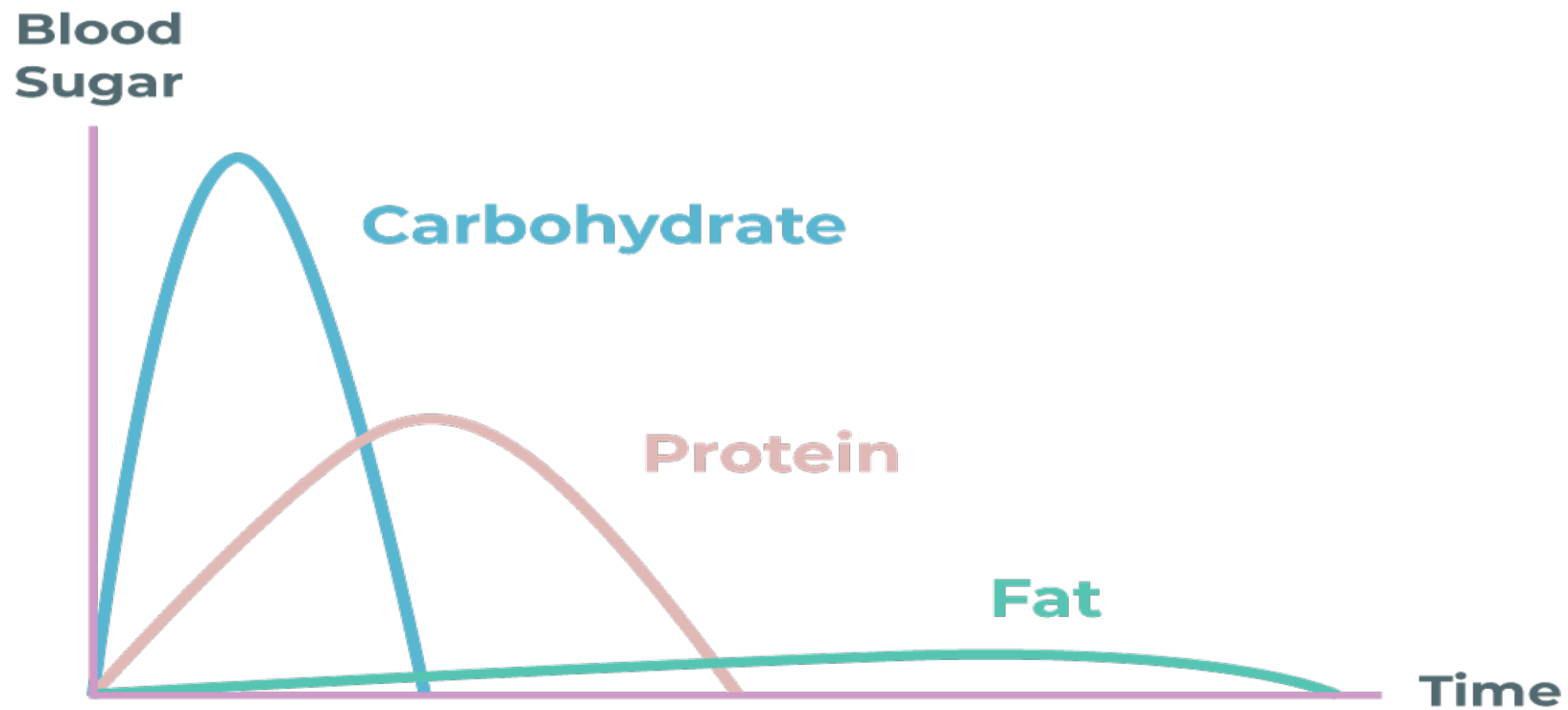


Sedentary lifestyle



Genetics/Epigenetics

# The macronutrients and blood sugar





# Carbohydrates

Organic compound that include sugar, starch and fibre  
Essentially chains of Glucose (type of sugar). The food that gives us energy.

## Simple Carbohydrates

Broken down to Glucose quickly in the body  
Fast release of energy  
Often lacking in vitamins

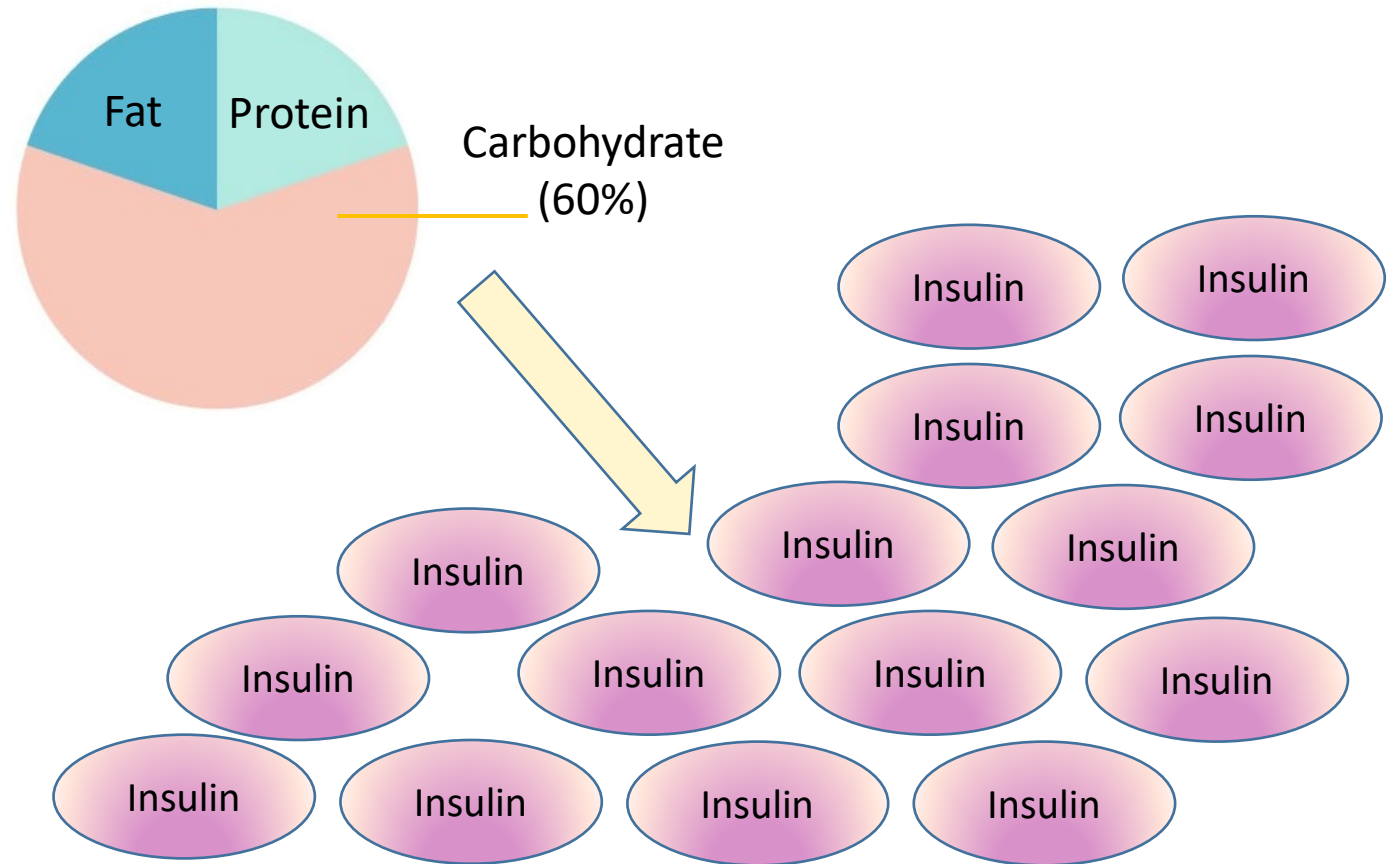
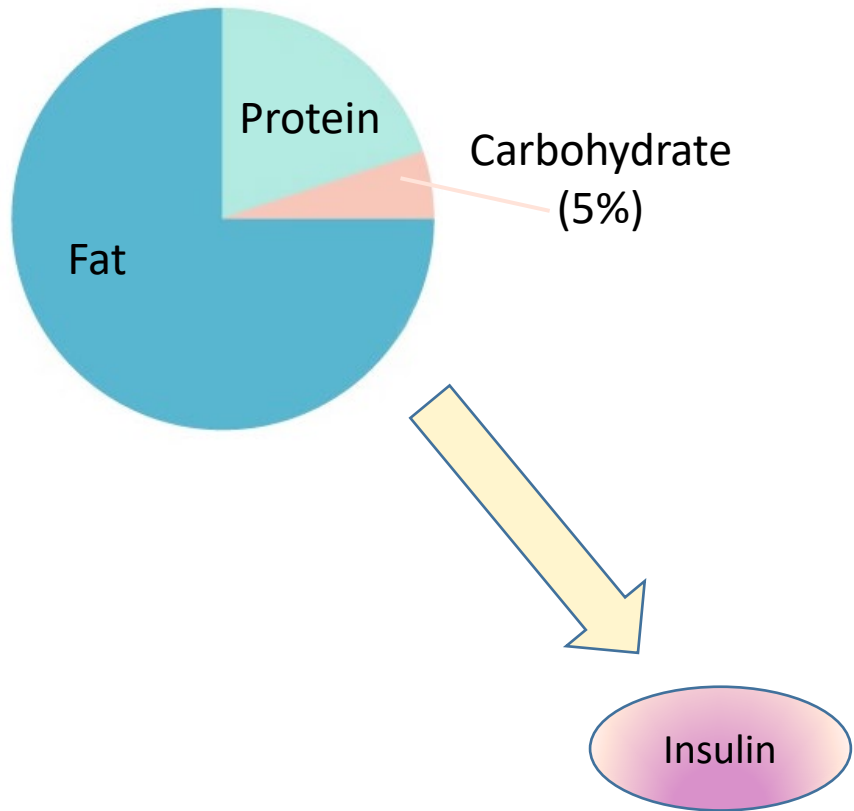


## Complex Carbohydrates

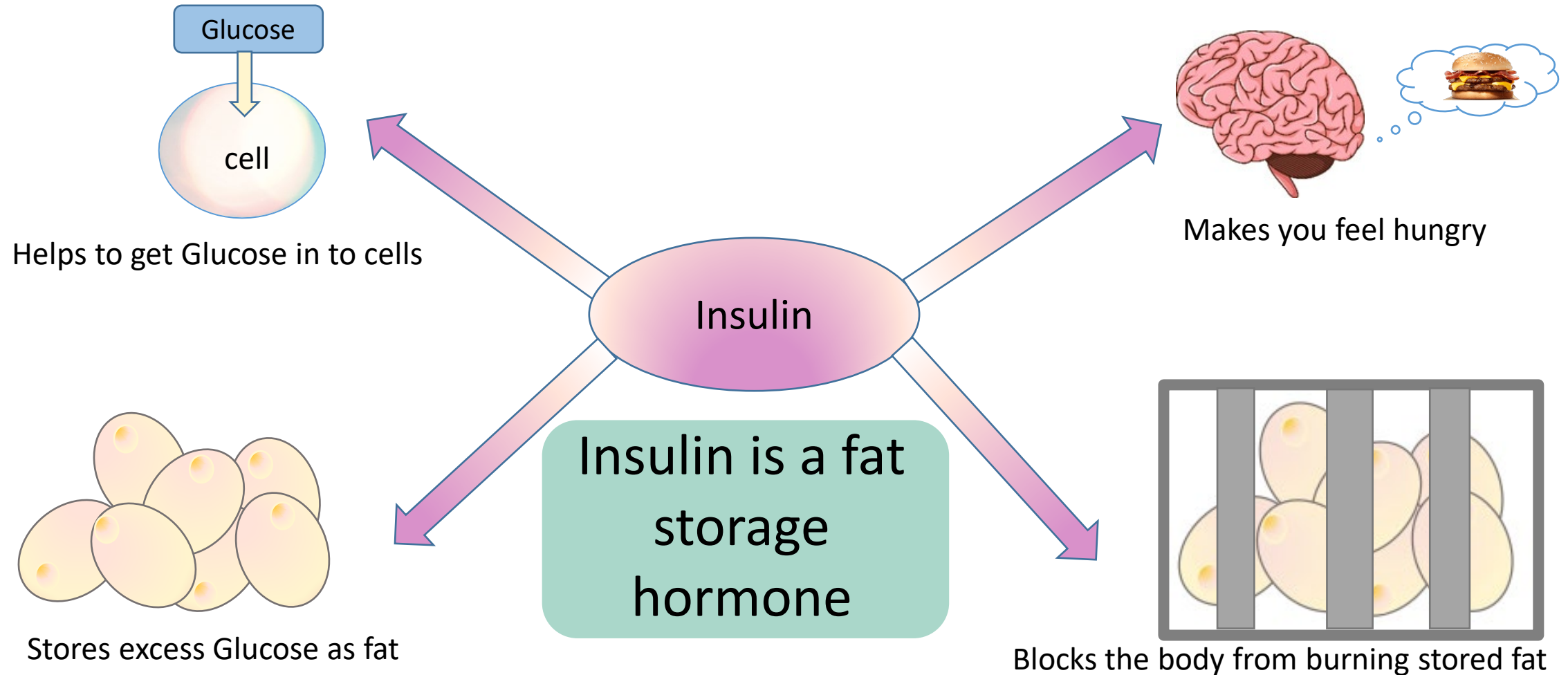
Broken down more slowly as 3+ 'parts' to it  
Slow release of energy  
Often contains a lot of multivitamins



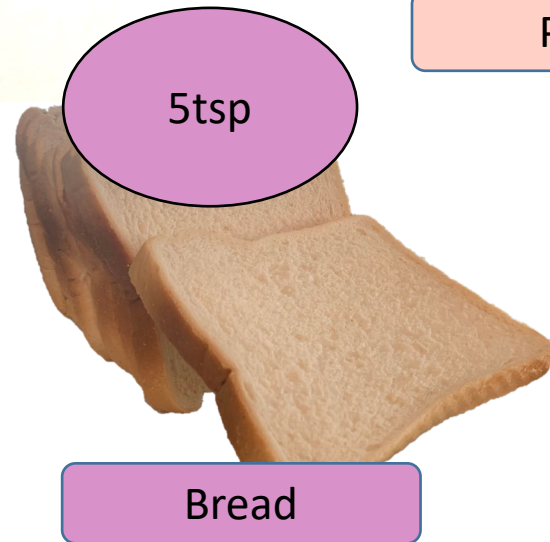
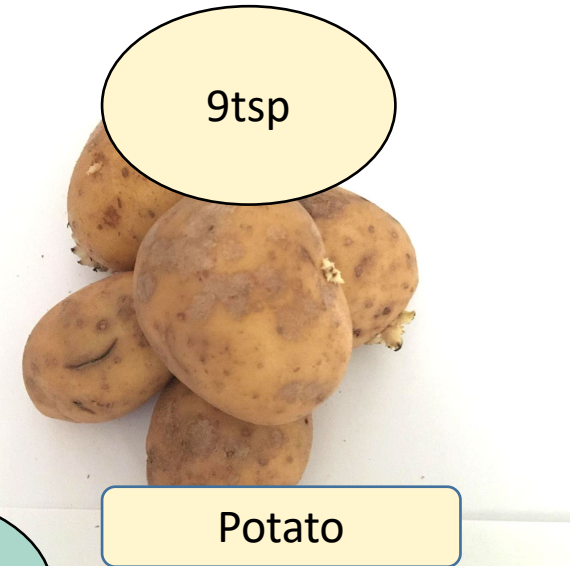
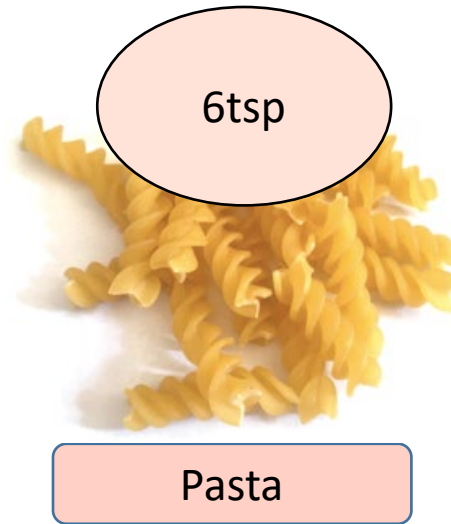
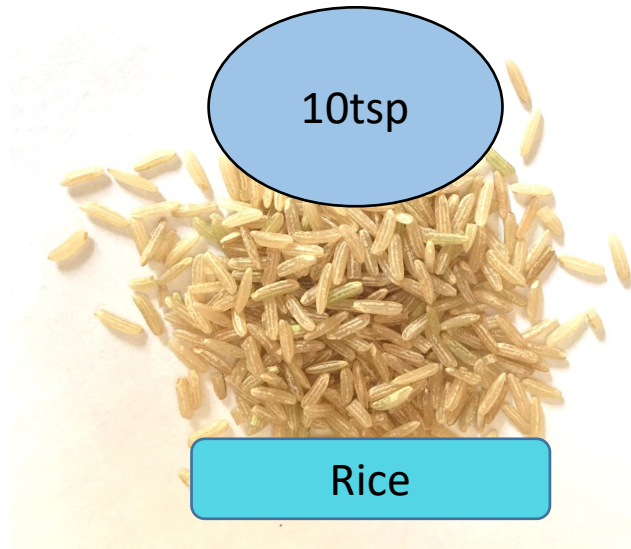
# A lot of Insulin!



# What does insulin do?

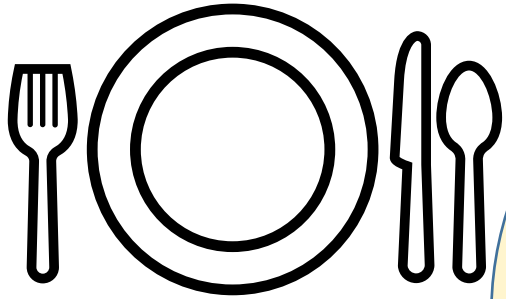


# The Big 5

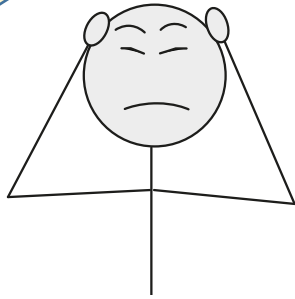




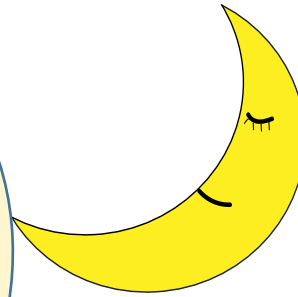
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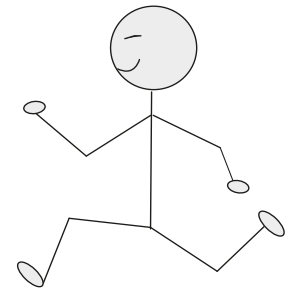
Foods that raise blood glucose



Chronic Stress



Lack of sleep



Sedentary lifestyle



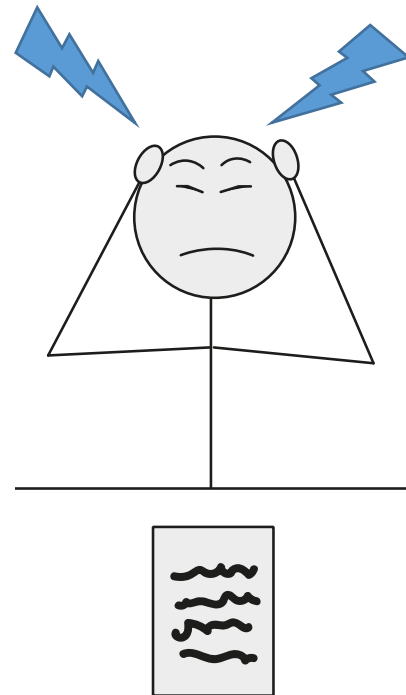
Genetics/Epigenetics

# Stress

The effects of chronic stress should not be underestimated.

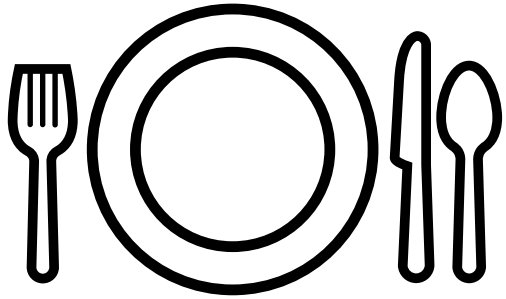
**Adrenaline** causes Glucose release and promotes inflammation leading to insulin resistance

**Cortisol** increases Insulin Resistance, Increases appetite and promotes fat storage

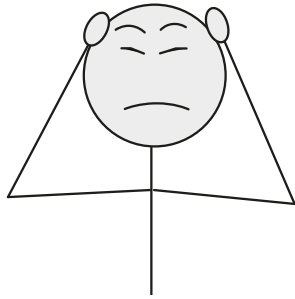


Stress is linked to weight gain – it makes us crave dense calories. We make poorer choices, and a stressed brain finds food even more rewarding than it would otherwise

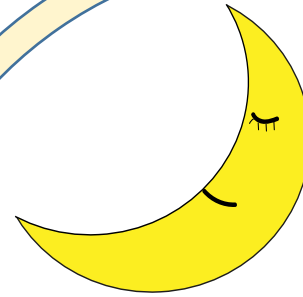
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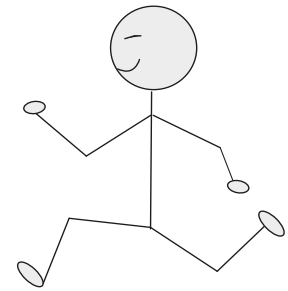
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Chronic Stress



Lack of sleep

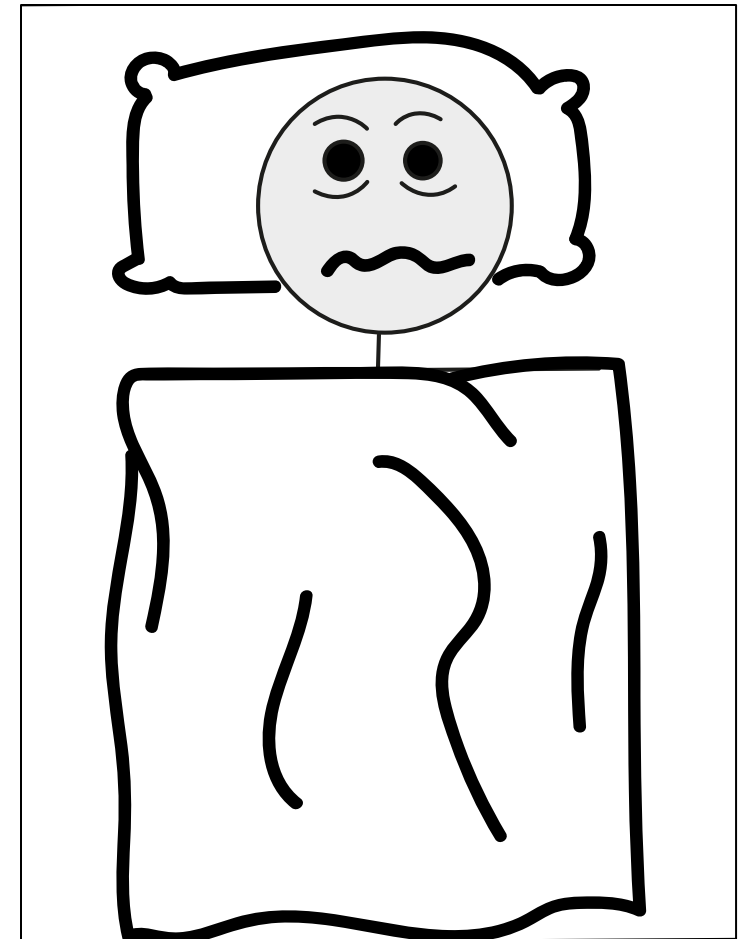
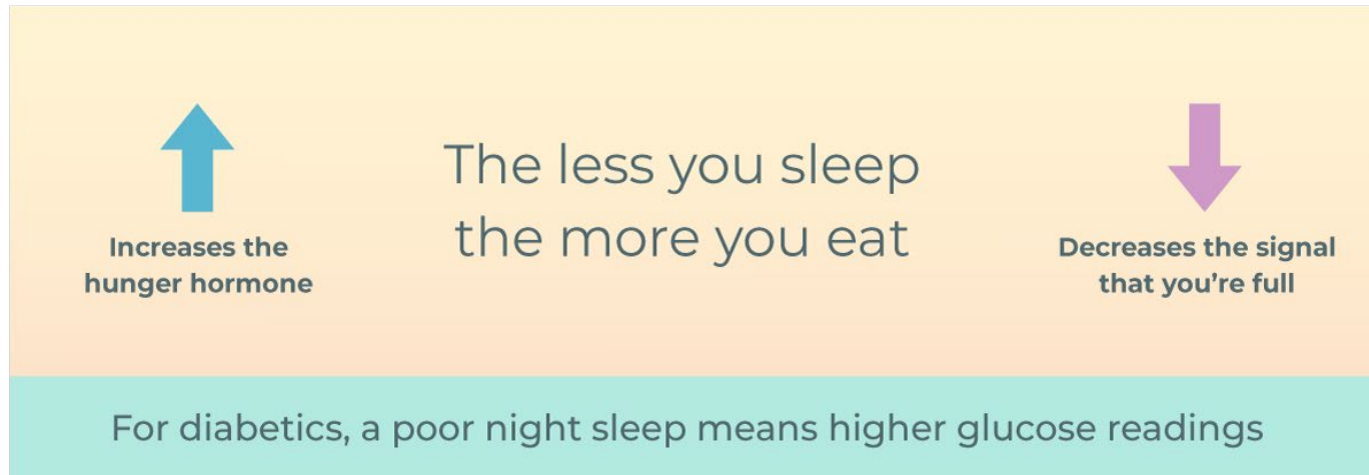


Sedentary lifestyle



Genetics/Epigenetics

# Sleep



Over 50% of those with Type 2 Diabetes also suffer from Obstructive Sleep Apnoea <sup>(3)</sup>

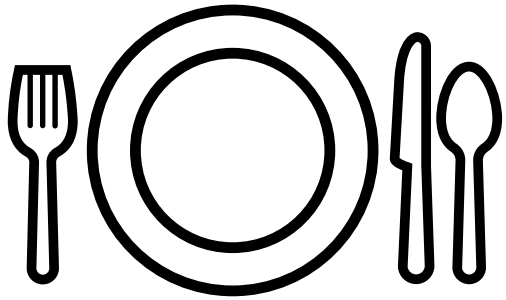
One study sleep deprived a group of young healthy males. After 6 nights – prediabetes <sup>(1)</sup>

1 night of poor sleep makes you less insulin sensitive the next day <sup>(2)</sup>

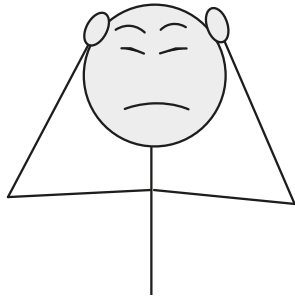
(1) Spiegel K, Leproult R, Van Cauter E. Impact of sleep debt on metabolic and endocrine function. *Lancet*. 1999;354(9188):1435–9.

(2) Donga E, van Dijk M, van Dijk JG, Biermasz NR, Lammers GJ, van Kralingen KW, Corsmit EP, Romijn JA. A single night of partial sleep deprivation induces insulin resistance in multiple metabolic pathways in healthy subjects. *J Clin Endocrinol Metab*. 2010 Jun;95(6):2963–8. doi: 10.1210/clin.2009.2430. Epub 2010 Apr 6. PMID: 20361111

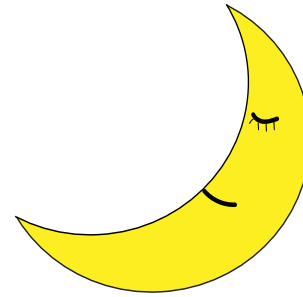
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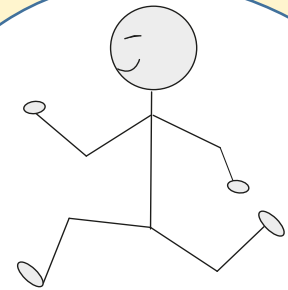
Foods that raise blood glucose



Chronic Stress



Lack of sleep



Sedentary lifestyle

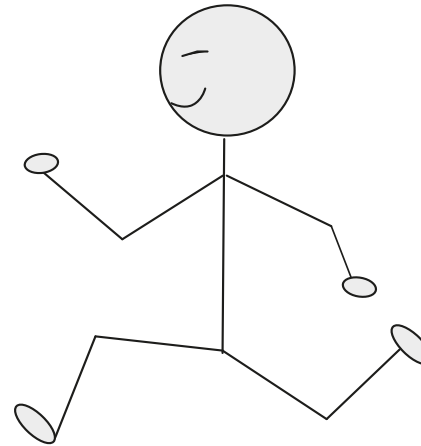
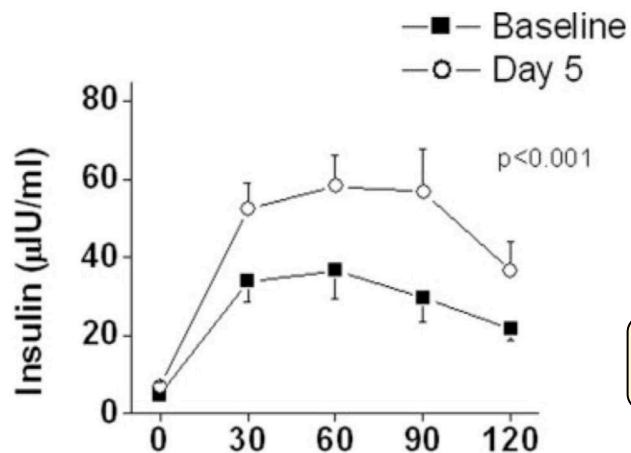
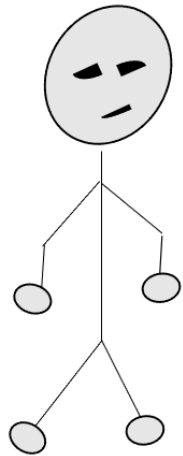


Genetics/Epigenetics



# Exercise

Sedentary Lifestyle is linked to insulin resistance



Regular Physical Activity decreases your risk of developing Diabetes by 40%

Keep moving

Get breathless

Build muscle

Something is better than nothing!

Acute benefits of glycaemic control can last up to 48-72hrs after exercise <sup>(1)</sup>

# IMPORTANCE OF 24-HOUR PHYSICAL BEHAVIOURS FOR TYPE 2 DIABETES

## SITTING/BREAKING UP PROLONGED SITTING

Limit sitting. Breaking up prolonged sitting (every 30 min) with short regular bouts of slow walking/simple resistance exercises can improve glucose metabolism.



## STEPPING

- An increase of only 500 steps/day is associated with 2-9% decreased risk of cardiovascular morbidity and all-cause mortality.
- A 5 to 6 min brisk intensity walk per day equates to ~4 years' greater life expectancy.



## SLEEP

Aim for consistent, uninterrupted sleep, even on weekends.



**Quantity** - Long (>8h) and short (<6h) sleep durations negatively impact HbA<sub>1c</sub>.



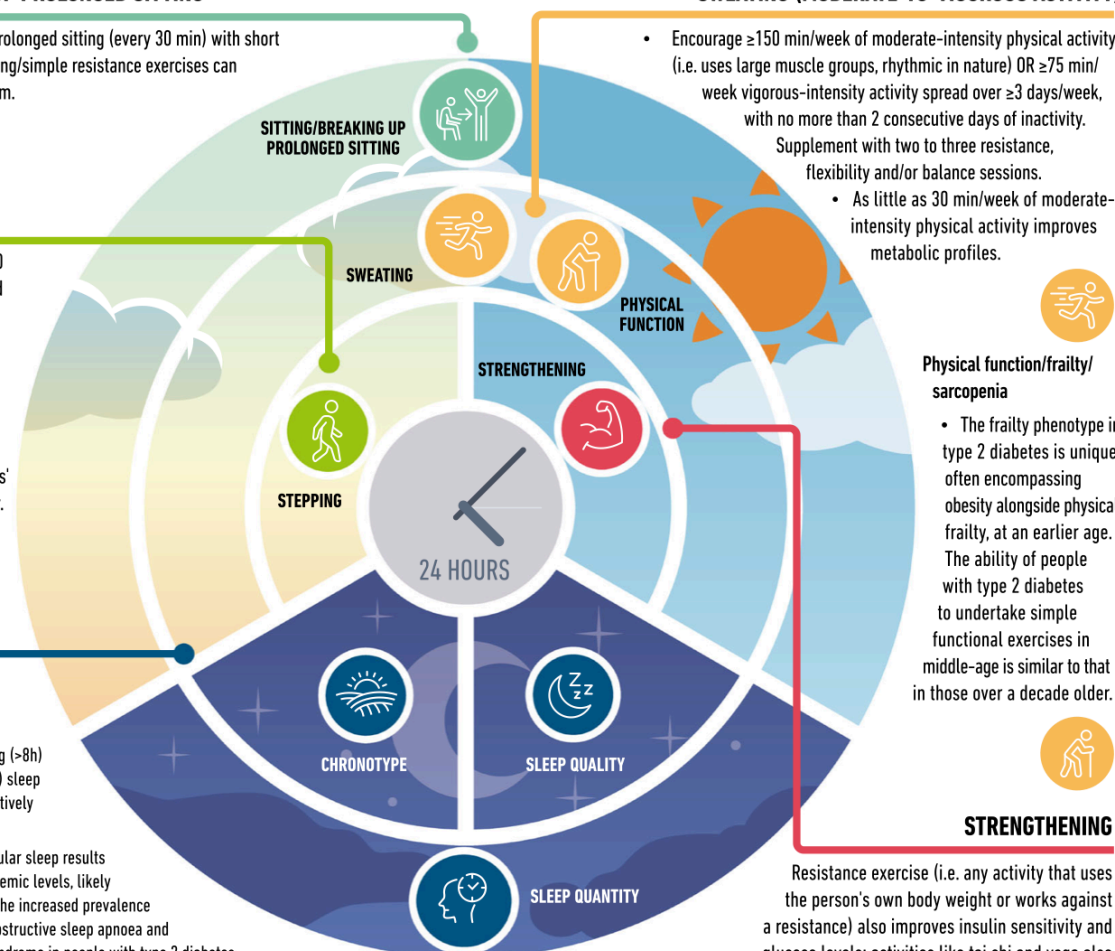
**Quality** - Irregular sleep results in poorer glycaemic levels, likely influenced by the increased prevalence of insomnia, obstructive sleep apnoea and restless leg syndrome in people with type 2 diabetes



**Chronotype** - Evening chronotypes (i.e. night owl: go to bed late and get up late) may be more susceptible to inactivity and poorer glycaemic levels vs morning chronotypes (i.e. early bird: go to bed early and get up early).

## SWEATING (MODERATE-TO-VIGOROUS ACTIVITY)

- Encourage  $\geq 150$  min/week of moderate-intensity physical activity (i.e. uses large muscle groups, rhythmic in nature) OR  $\geq 75$  min/week vigorous-intensity activity spread over  $\geq 3$  days/week, with no more than 2 consecutive days of inactivity. Supplement with two to three resistance, flexibility and/or balance sessions.
- As little as 30 min/week of moderate-intensity physical activity improves metabolic profiles.



## Physical function/frailty/sarcopenia

- The frailty phenotype in type 2 diabetes is unique, often encompassing obesity alongside physical frailty, at an earlier age. The ability of people with type 2 diabetes to undertake simple functional exercises in middle-age is similar to that in those over a decade older.

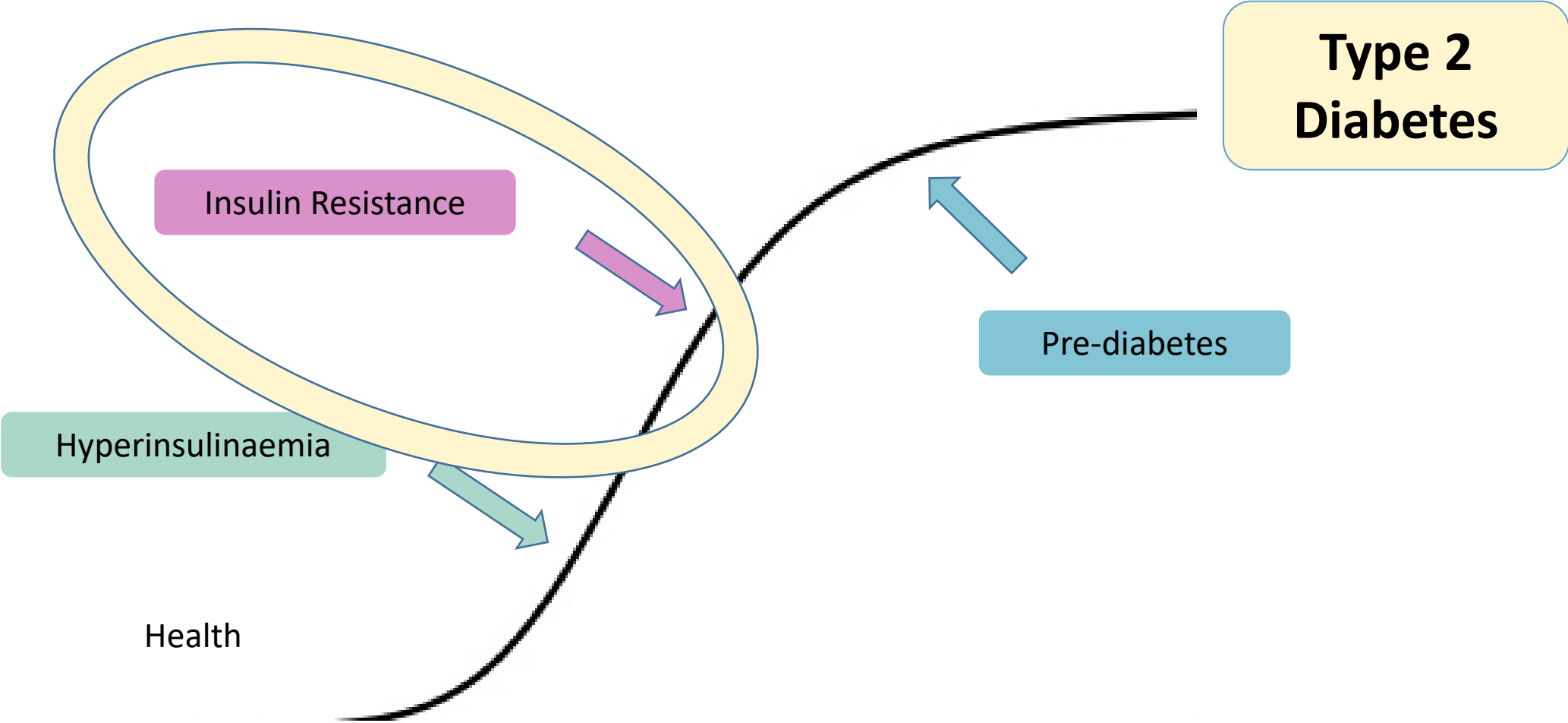


## STRENGTHENING

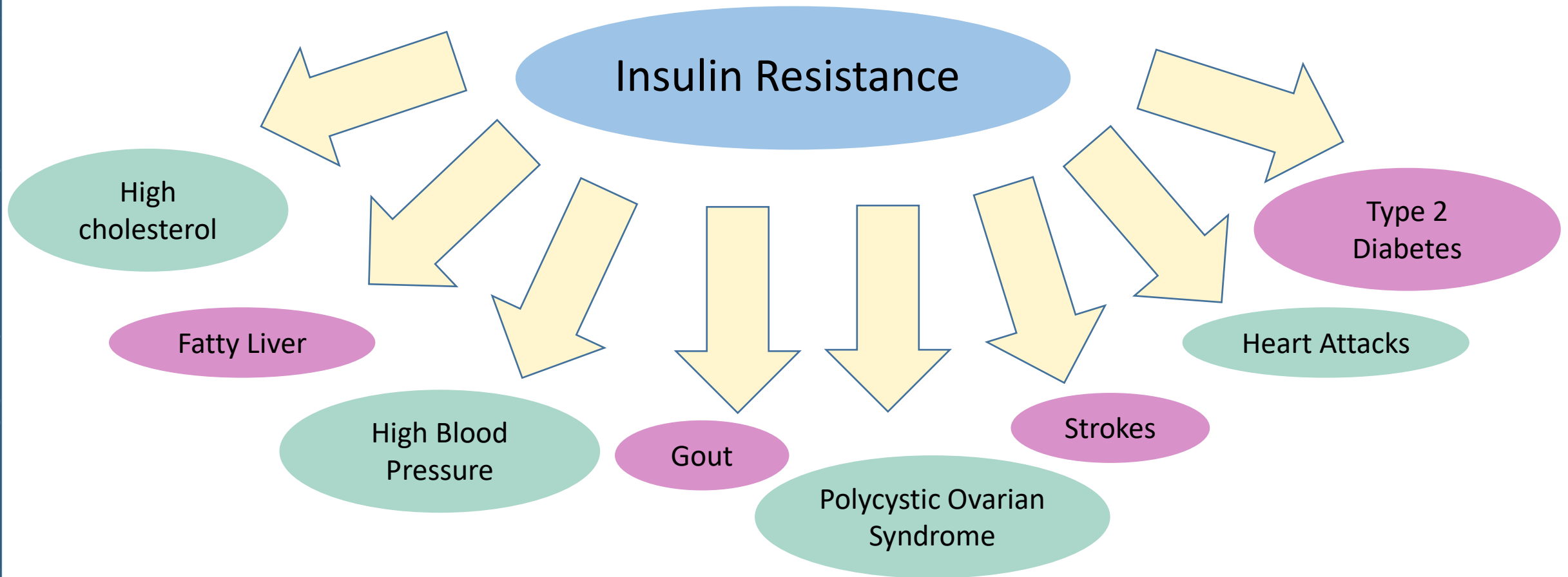
Resistance exercise (i.e. any activity that uses the person's own body weight or works against a resistance) also improves insulin sensitivity and glucose levels; activities like tai chi and yoga also encompass elements of flexibility and balance.



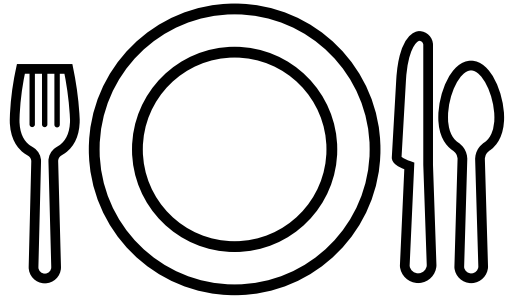
# Health & Disease Curve



# Why: treating the Underlying Cause

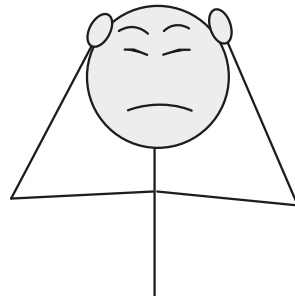


# Support Available



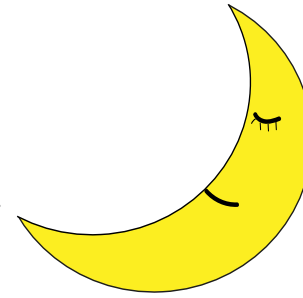
Foods that raise blood glucose

AWDPP  
Dietetic dpt  
Diabetes.co.uk  
Diabetes UK



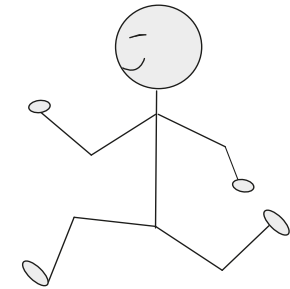
Chronic Stress

Calm  
Headspace  
The Stress Solution  
book (Rangan  
Chaterjee)



Lack of sleep

Sleepio  
Calm

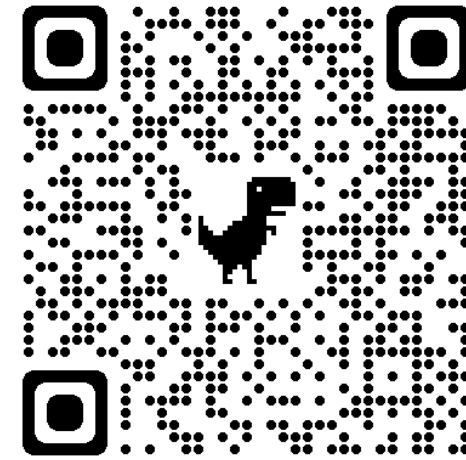


Sedentary lifestyle

Couch to 5k  
NERS  
Change4life  
Walk4life  
Parkrun



# Lifestyle Clinic Hub



Get control of  
your health



Downloads



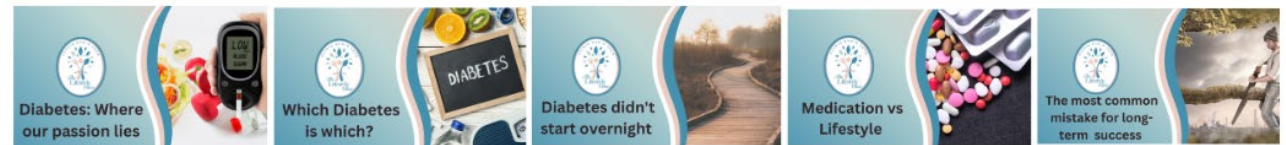
## Free videos

Getting control of your health should be easy

We provide courses for those who want to lose weight, treat  
Prediabetes and Type 2 Diabetes using lifestyle medicine

[www.thelifestyleclinic.co.uk/registerhub](http://www.thelifestyleclinic.co.uk/registerhub)

### Diabetes



### Prediabetes



### Weight Loss









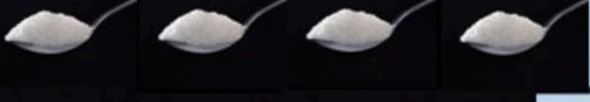
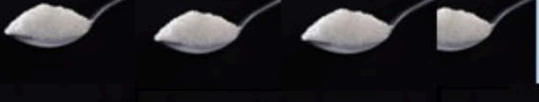
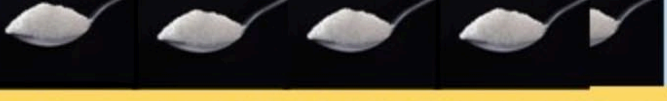
# Mrs Jones

- Females
- Aged 60+
- Prediabetes
- About to go on to insulin/referred
- Those who 'do not like tablets'
- Those that have side-effects



What do you eat for  
breakfast?





The Glycaemic Index helps predict how these breakfasts might affect blood glucose, important information if you have type 2 diabetes

Cereal	Glycaemic Index	Serve size	How does each cereal affect blood glucose compared to 4g teaspoons of table sugar?
Coco Pops	77	30g	7.3 
Cornflakes	93	30g	8.4 
Mini Wheats	59	30g	4.4 
Shredded Wheat	67	30g	4.8 
Special K	54	30g	4.0 
Bran Flakes	74	30g	3.7 
Oat porridge	63	150ml	4.4 

As per calculations to be found in: It is the glycaemic response to, not the carbohydrate content of food that matters in diabetes and obesity:  
 The glycaemic index revisited | Unwin | Journal of Insulin Resistance 2016 @lowcarbGP



## A healthy breakfast: cereals, toast, fruit juice?

Food item	Serving size in g/ml	How does each food affect blood glucose compared with one 4g teaspoon of table sugar?
Bran flakes	30	3.7 
Milk	125	1 
Brown toast, 1 slice	30	3 
Pure Apple juice	200	8.6 

**Total for breakfast 16.3 teaspoons**

**Useful information for those with T2Diabetes making dietary choices**

\*As per calculations derived from the glycaemic index. To be found in: *It's the glycaemic response to, not the carbohydrate content of food that matters in diabetes and obesity* Journal of Insulin Resistance 2016. Unwin et al

Thank you!



[www.thelifestyleclinic.co.uk](http://www.thelifestyleclinic.co.uk)

[Nerys.frater@wales.nhs.uk](mailto:Nerys.frater@wales.nhs.uk)



@nerysfrater



NerysFrater