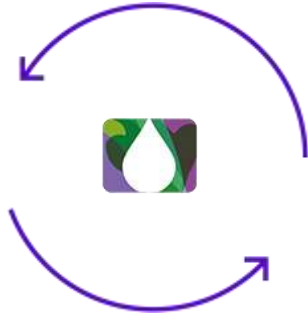


# Rethinking Diabetes Care

Dr. Mariela Glandt

Denver, Feb 2023

# Conflict of Interests



**Glandt Center**

Clinic



**Metabolix**

Education NGO



**Eatsane**

Low carb food  
products



**OwnaHealth**

Digital diabetes  
care platform



NDC 0088-2219-05

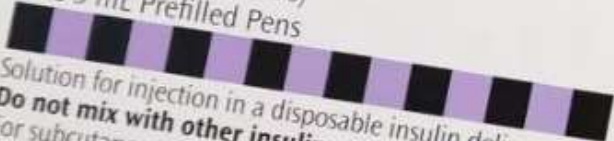
# Lantus<sup>®</sup> SoloStar<sup>®</sup>

insulin glargine injection

For Single Patient Use Only

100 units/mL (U-100)

Five 3 mL Prefilled Pens



Solution for injection in a disposable insulin delivery device

**Do not mix with other insulins**


For subcutaneous injection only

Use only if solution is clear and colorless with no particles visible

Use within 28 days after initial use

**\*Needles not included (see back panel)**



SANOFI 



**Glandt Center**  
for Diabetes Care

## Meet HK

**65** years old man  
Diabetes for 30 years + CVD



### Diabetes Meds: **A1c 6%**

- Long acting insulin 20 units
- Short acting insulin 5 units before each meal
- Metformin 850mg TID
- Victoza 1.8mg
- Actos 15mg
- Jardiance 12.5mg

### Hypertension **125/80**

- Norvasc 5mg
- Enalapril 20mg
- Cardiloc 2.5mg

### Cholesterol **LDL 75, HDL 55, TG 80**

- On lipitor 20mg

### Weight **92.6 kilos**

**I'm doing a GREAT job!!**

## Meet HK

**65** years old man  
Diabetes for 30 years + CVD

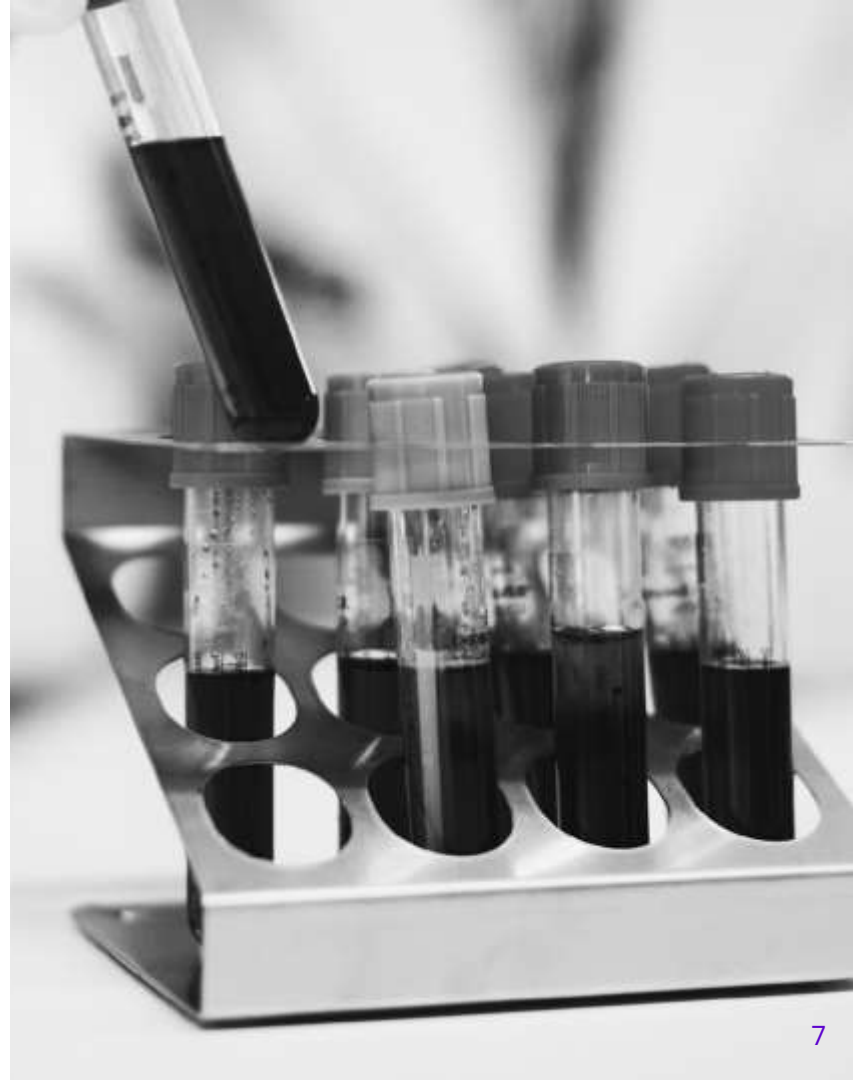
- **Shots 5** times a **day**
- **Checking sugar 3** times a **day**
- Actos which causes **weight gain**
- Jardiance frequent **urination**
- **Muscle cramps**
- **Impotence**

# Am I doing a GREAT job?

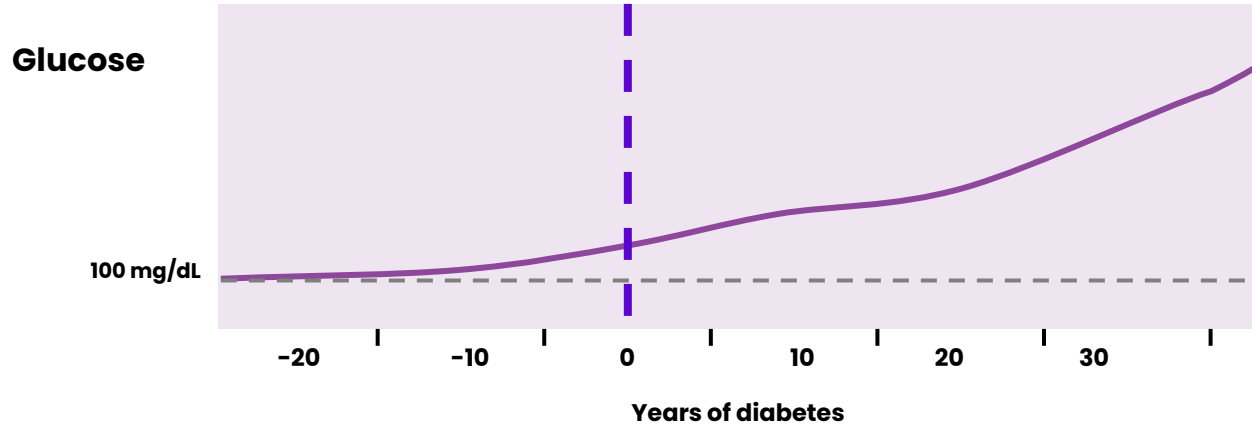


# Diagnosis of Diabetes

	TYPE 2
<b>Fasting Glucose (mg/dl)</b>	<b><math>\geq 126</math></b>
<b>Postprandial Glucose (mg/dl)</b>	<b><math>\geq 200</math></b>
<b>HbA1c</b>	<b><math>\geq 6.5\%</math></b>

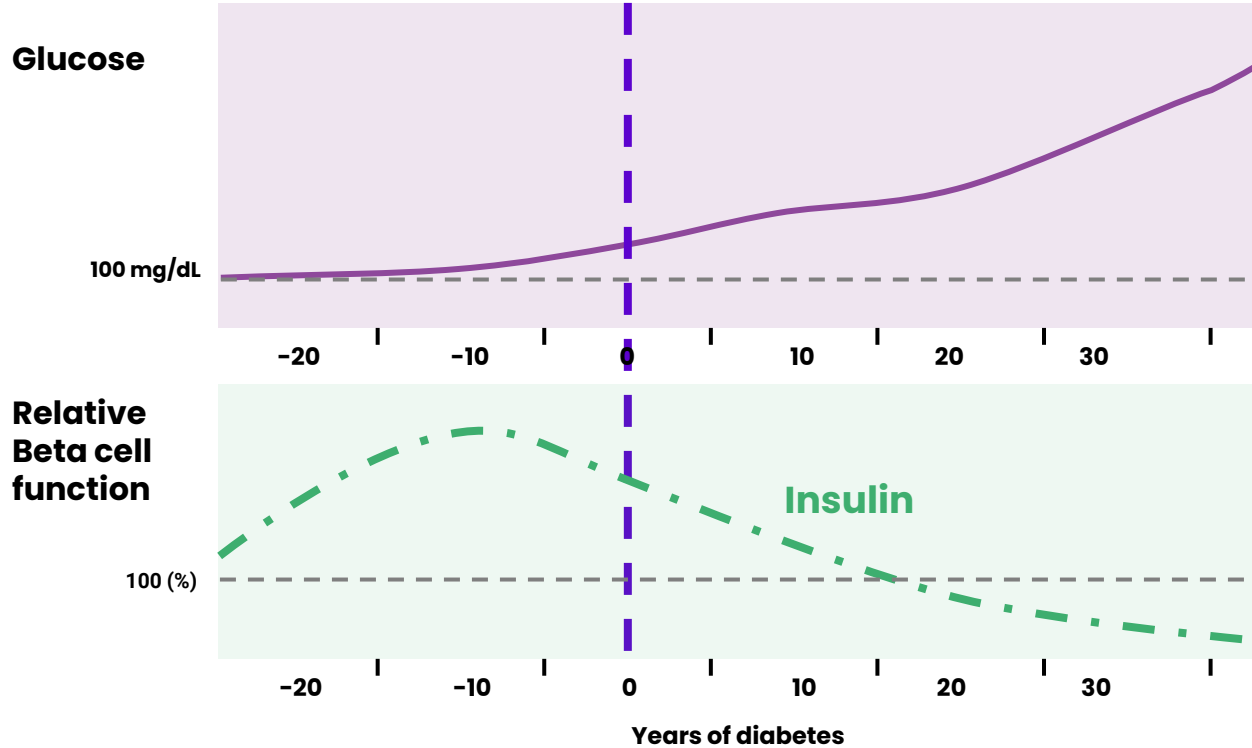


# Natural history of Type 2 Diabetes

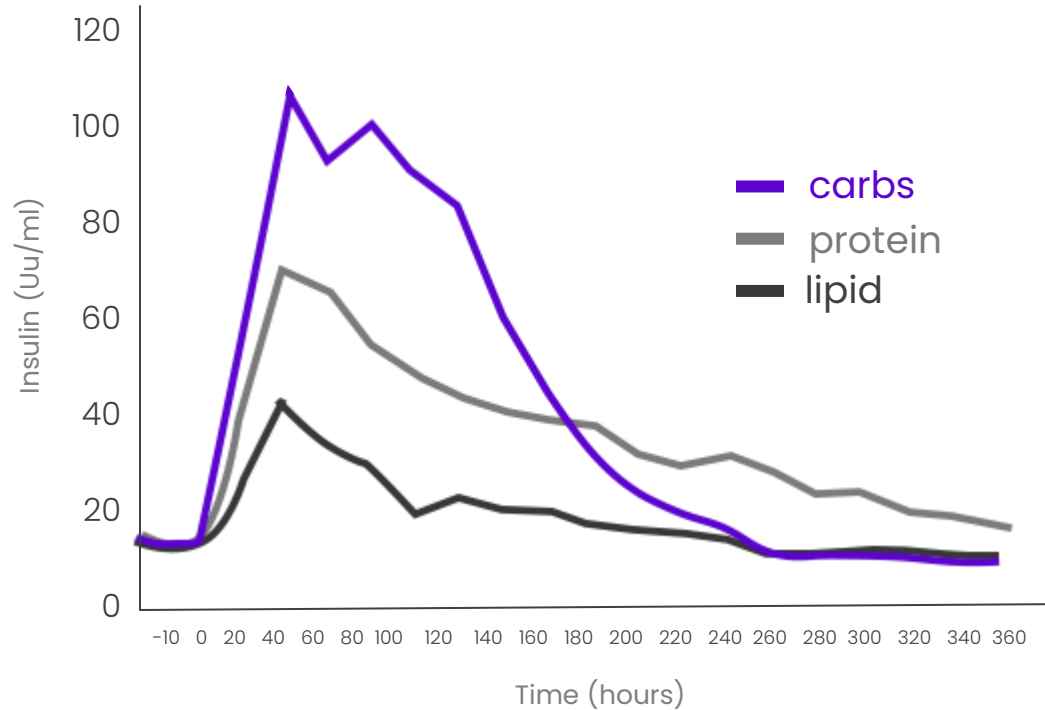




# Natural history of Type 2 Diabetes

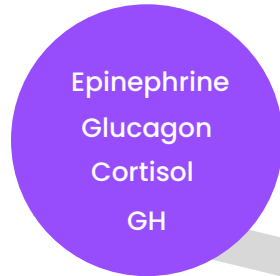


# Insulin is a hormone secreted in response to food intake



# Balance between building and breaking down

**CATABOLISM**  
(breakdown/use)



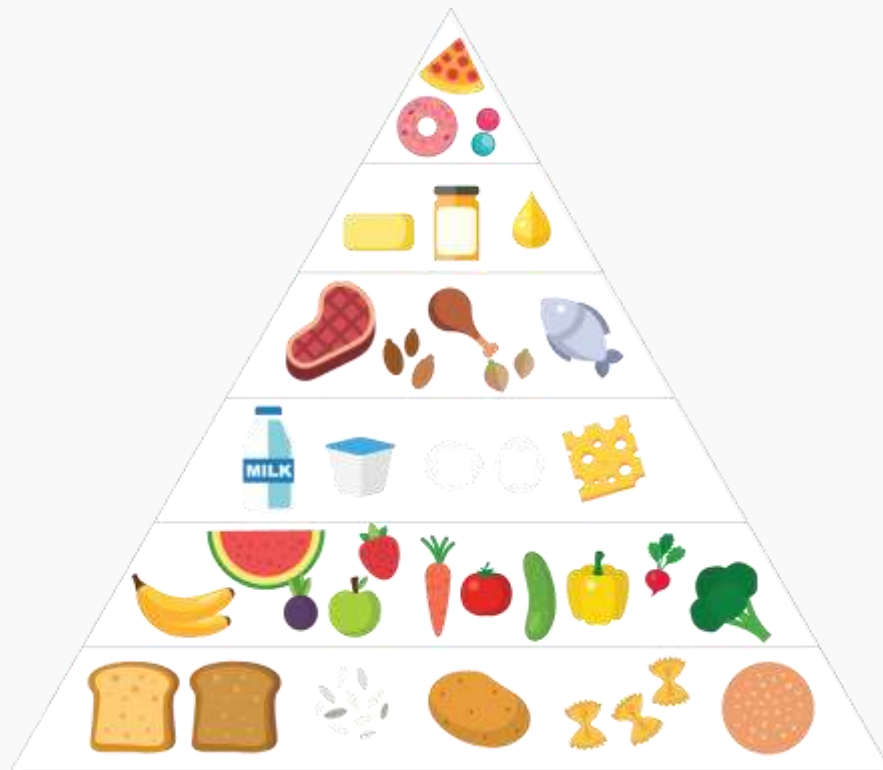
**ANABOLISM**  
(build/store)



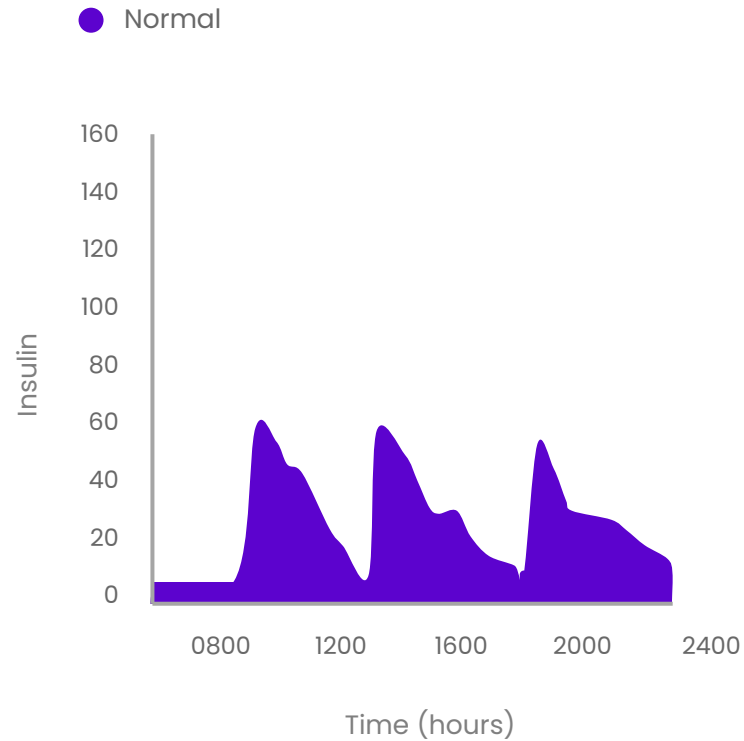
- Glucose uptake
- Lipid synthesis  
And inhibition of  
breaking down  
fat
- Protein synthesis
- Cell proliferation

**We are  
constantly  
in storage  
mode**

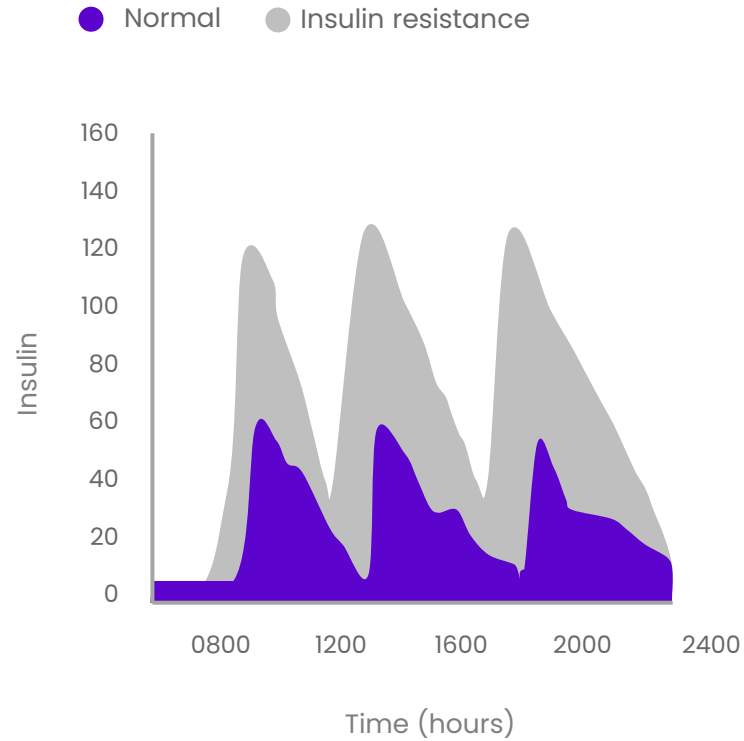
Insulin secretion



# Normal Insulin Secretion



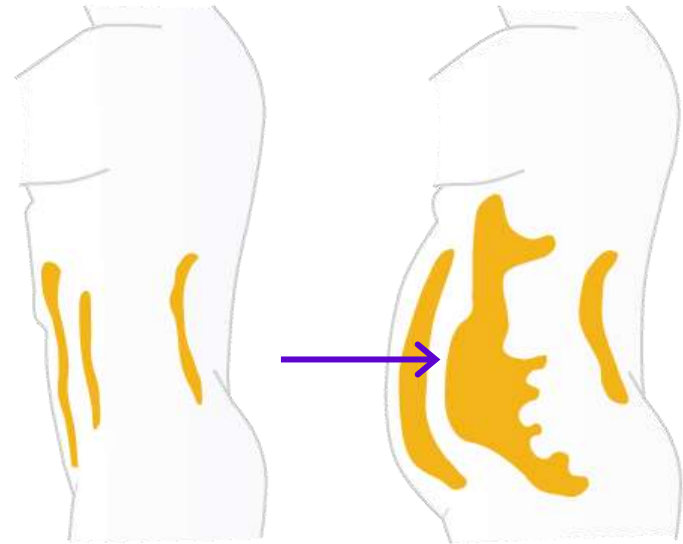
# Insulin Resistance



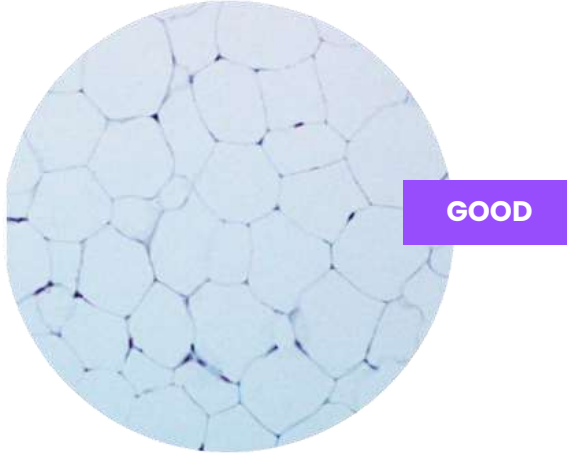
**Fat is supposed to be stored under the skin  
Subcutaneous fat**



**Visceral fat- fat  
stored within the  
abdominal cavity**

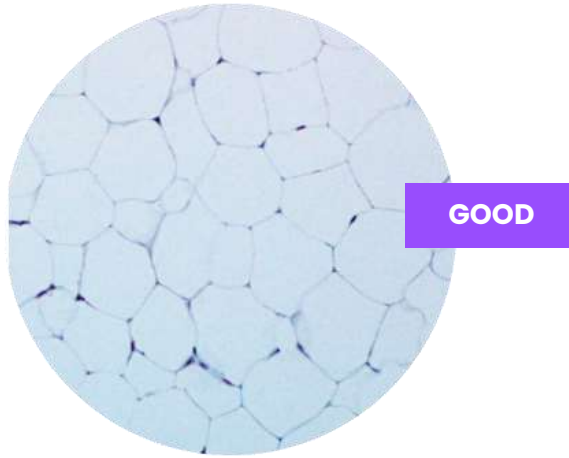




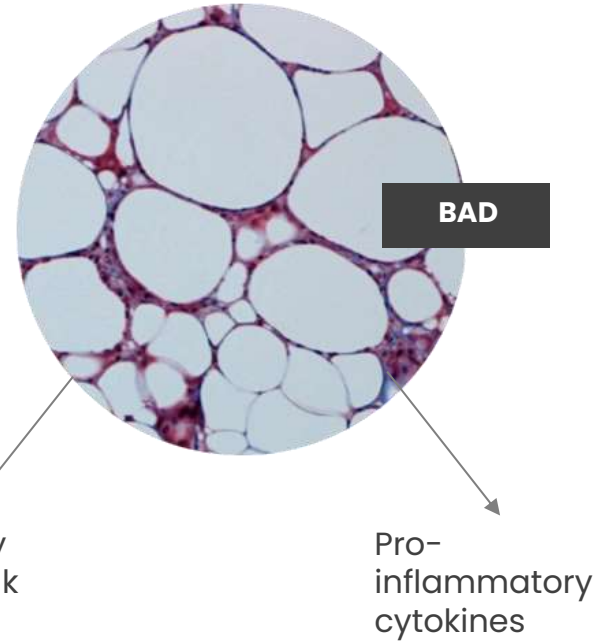


## Fat expansion

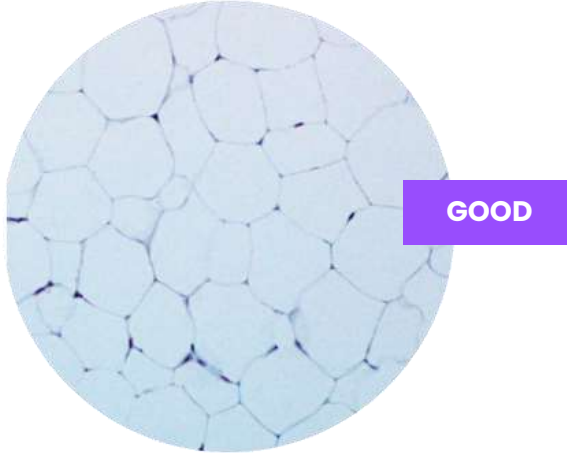
**Hyperplasia**  
Healthy  
Adipocytes



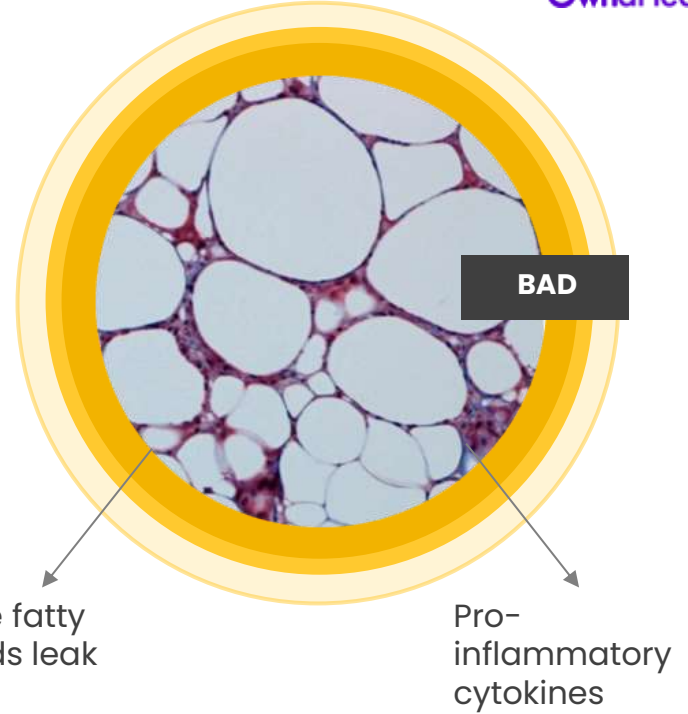
**Hyperplasia**  
Healthy  
Adipocytes



**Hypertrophy**  
Insulin resistant  
Adipocytes



**Hyperplasia**  
Healthy  
Adipocytes



**Hypertrophy**  
Insulin resistant  
Adipocytes

# Ectopic fat (Fat not stored inside fat cells)



**KIDNEY**



**HEART**



**MUSCLE**



**LIVER**

# **Fatty liver is made much worse by fructose and seed oils**



# Ectopic fat – Fat not stored inside fat cells



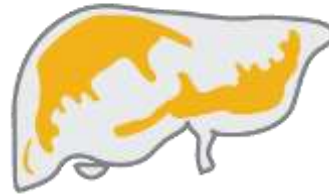
**KIDNEY**



**HEART**



**MUSCLE**



**LIVER**

# Ectopic fat – Fat not stored inside fat cells



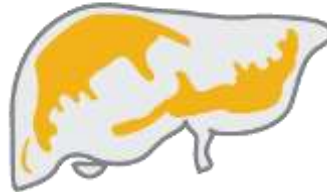
**KIDNEY**



**HEART**



**MUSCLE**

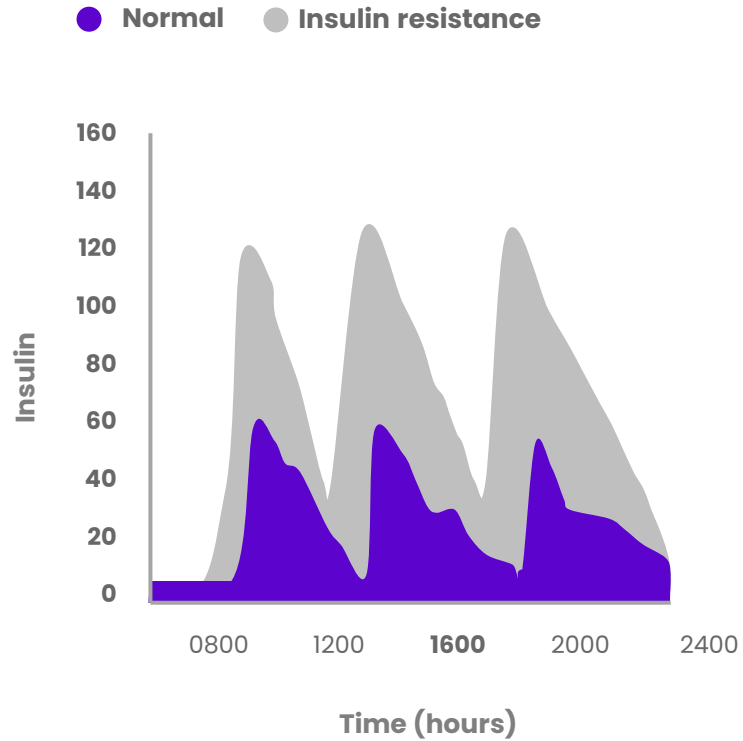


**LIVER**



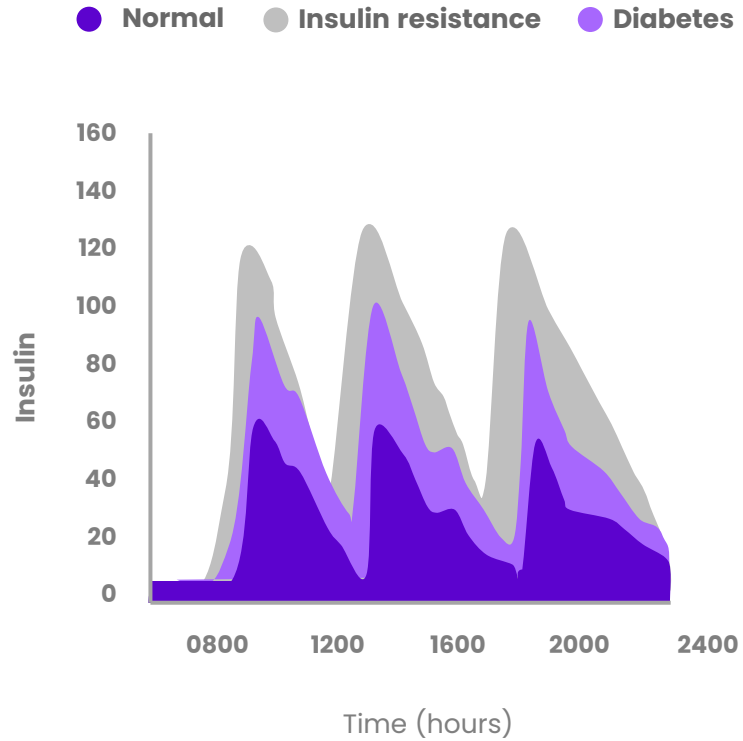
**PANCREAS**

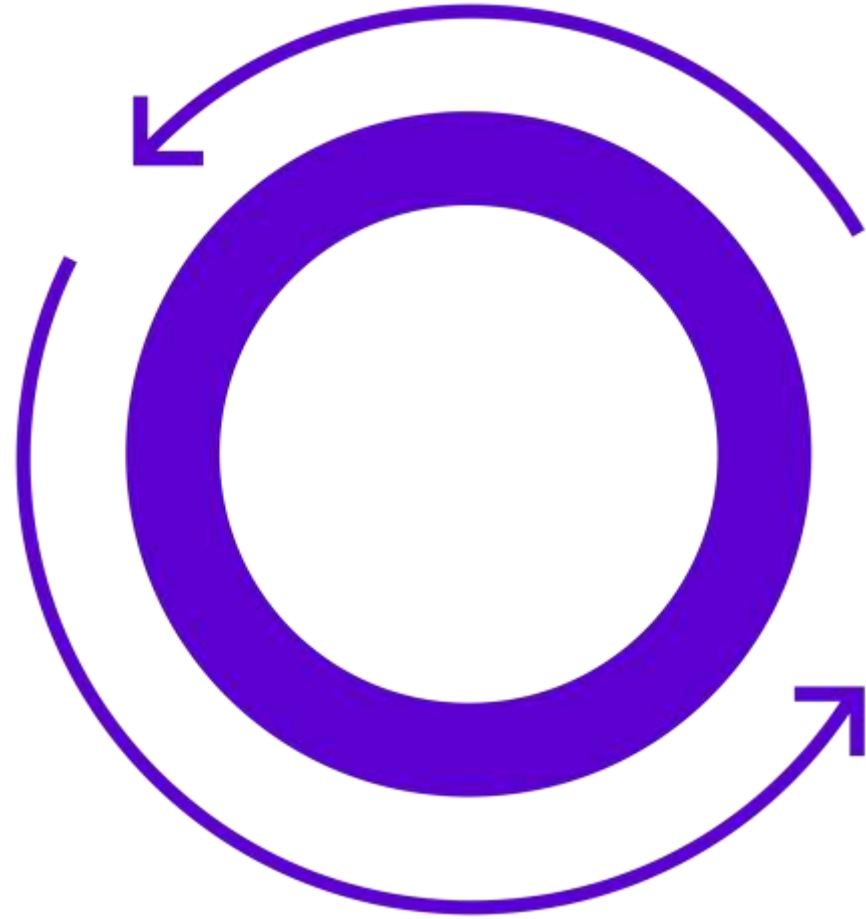
# Insulin Resistance





# Diabetes





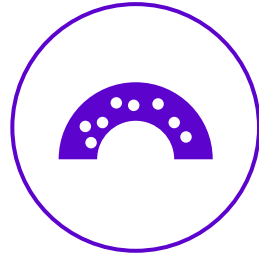
**Diabetes is one of the symptoms of insulin resistance**

# Signs and symptoms of insulin resistance



## Weight gain

Inc waist circumference



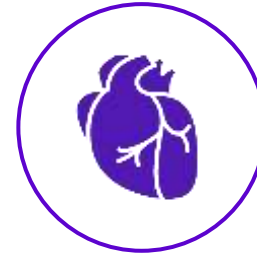
## High Triglycerides

> 150 mg/dL



## Low HDL

< 40 mg/dL in males  
< 50 mg/dL in females



## Hypertension

Systolic BP  $\geq$  130 or  
Diastolic BP  $\geq$  85 mm Hg

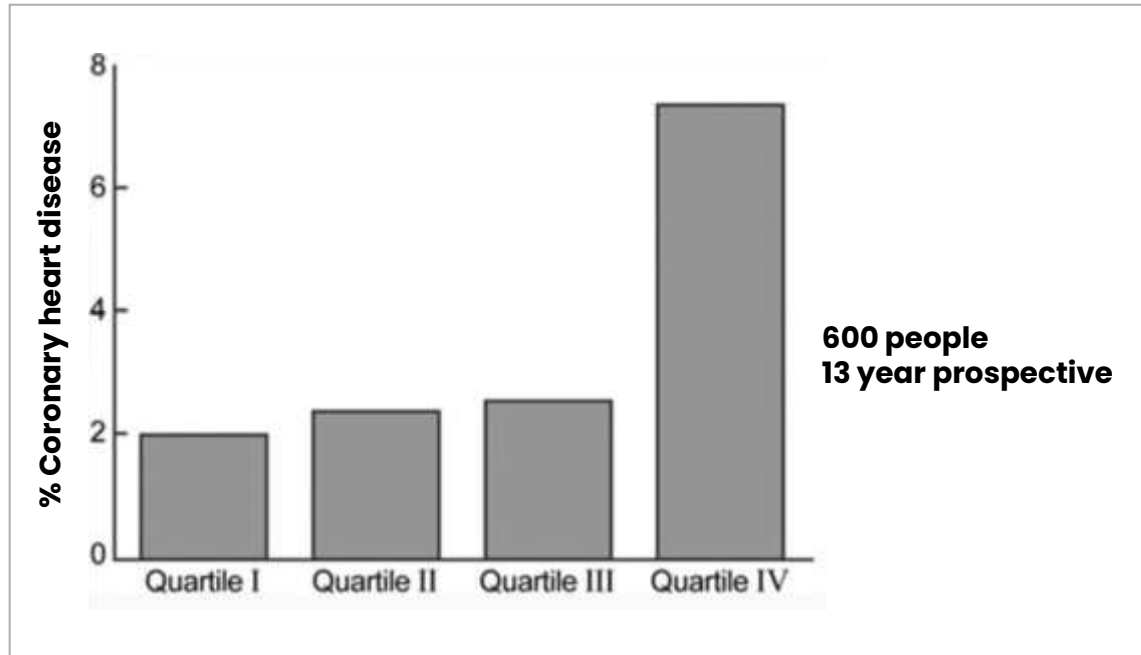


## Dysglycemia

(FPG)  $\geq$  100 mg/dL

**Risk factor for CV disease**



# Hyperinsulinemia is a predictor of coronary heart disease



# Hyperinsulinemia is an Independent Risk Factor For Ischemic Heart Disease



The NEW ENGLAND  
JOURNAL of MEDICINE



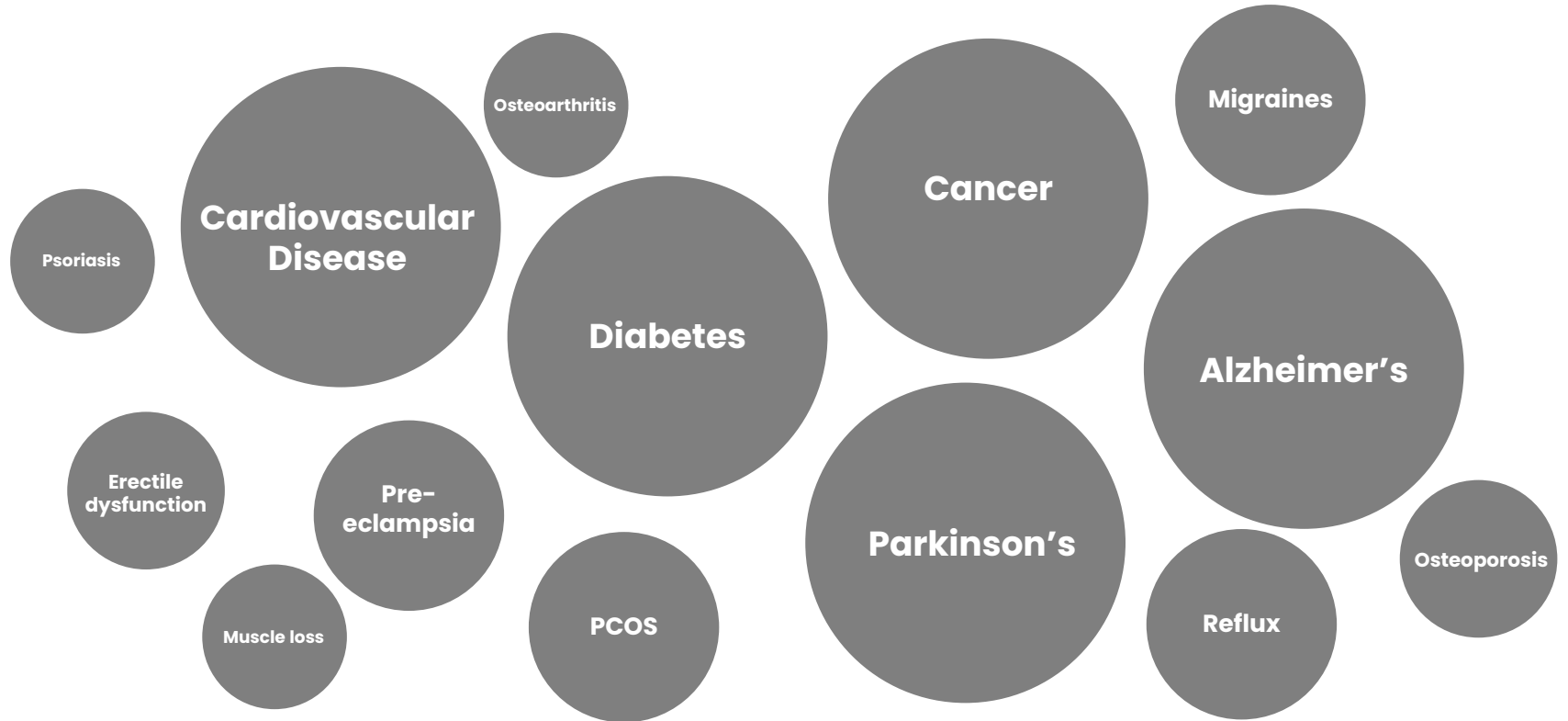
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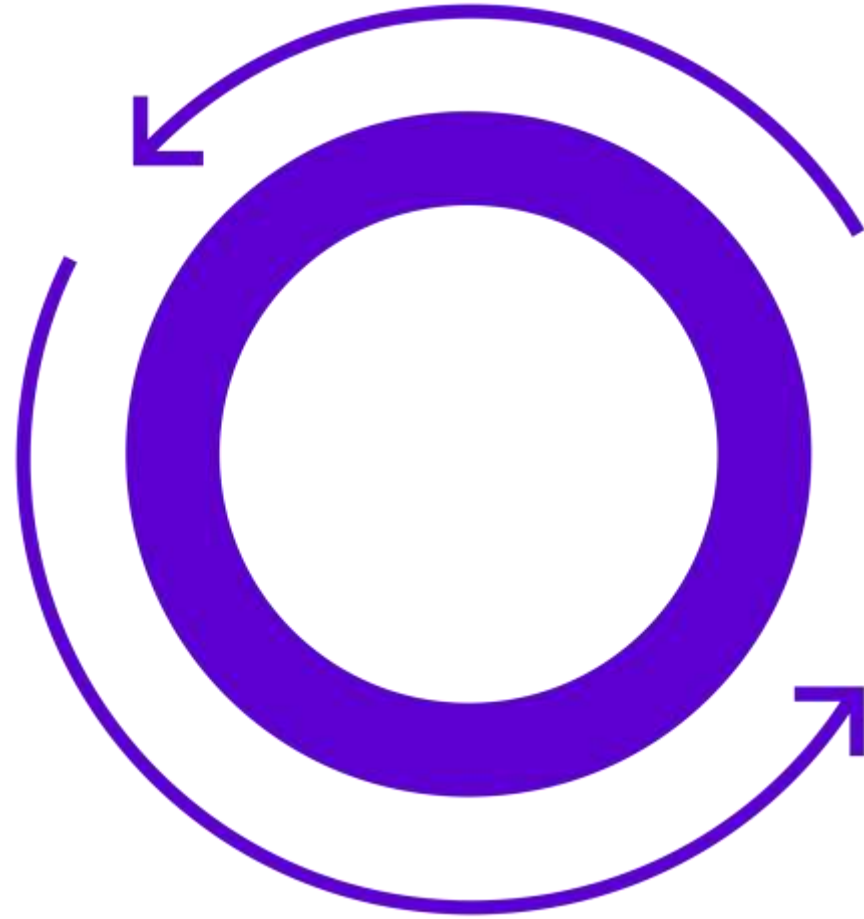
ORIGINAL ARTICLE

## Hyperinsulinemia as an Independent Risk Factor for Ischemic Heart Disease

Jean-Pierre Després, Ph.D., Benoît Lamarche, M.Sc., Pascale Mauriège, Ph.D., Bernard Cantin, M.D., Gilles R. Dagenais, M.D., Sital Moorjani, Ph.D., and Paul-J. Lupien, M.D.et al.

# Insulin resistance is linked to many chronic diseases

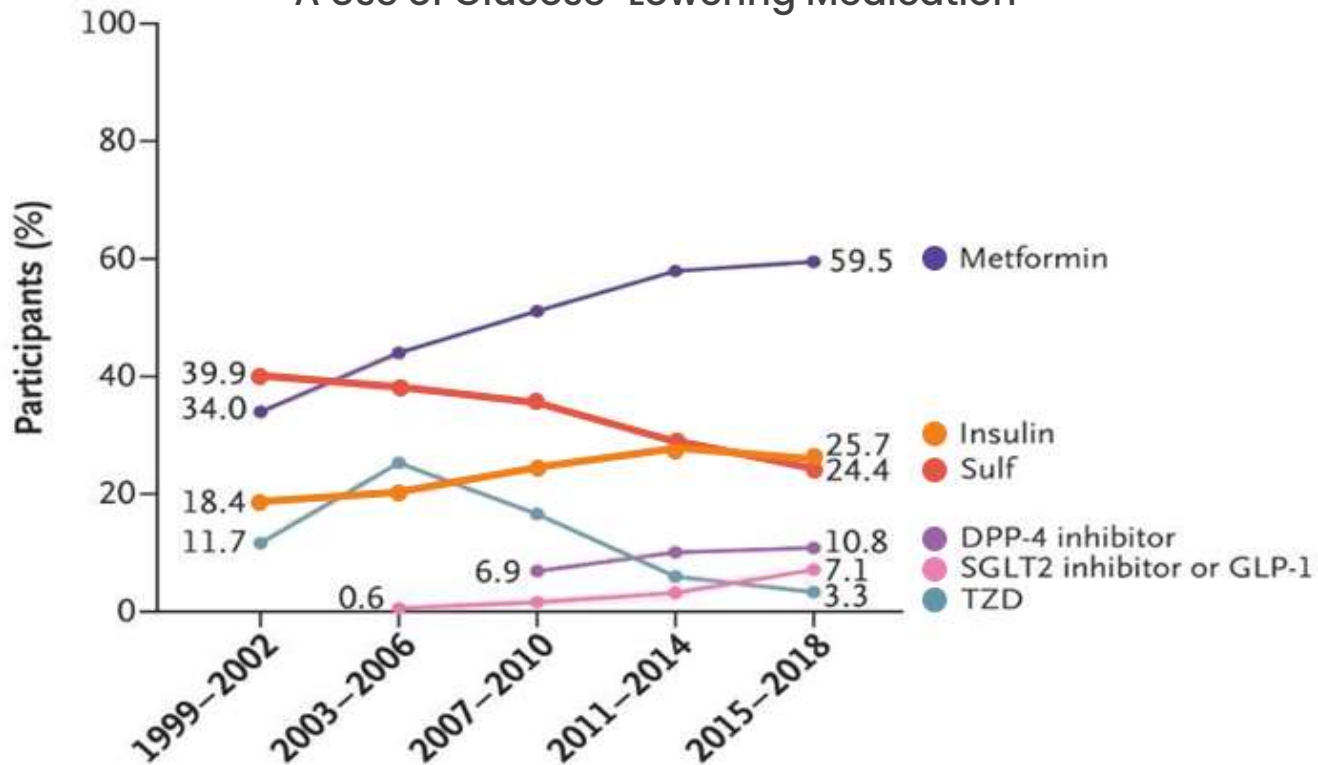




**Should we be  
treating patients  
with insulin?**

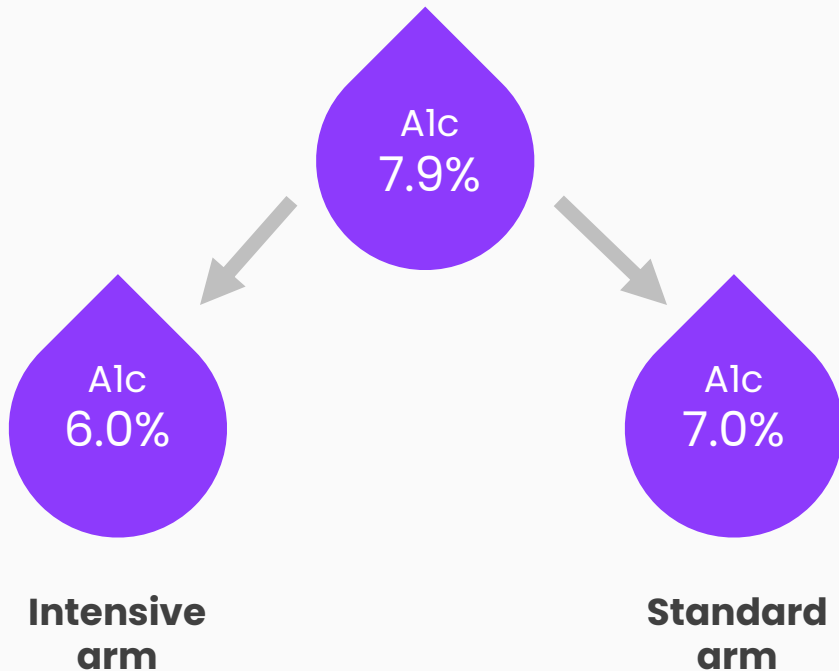
# Current Diabetes Treatment

A Use of Glucose-Lowering Medication



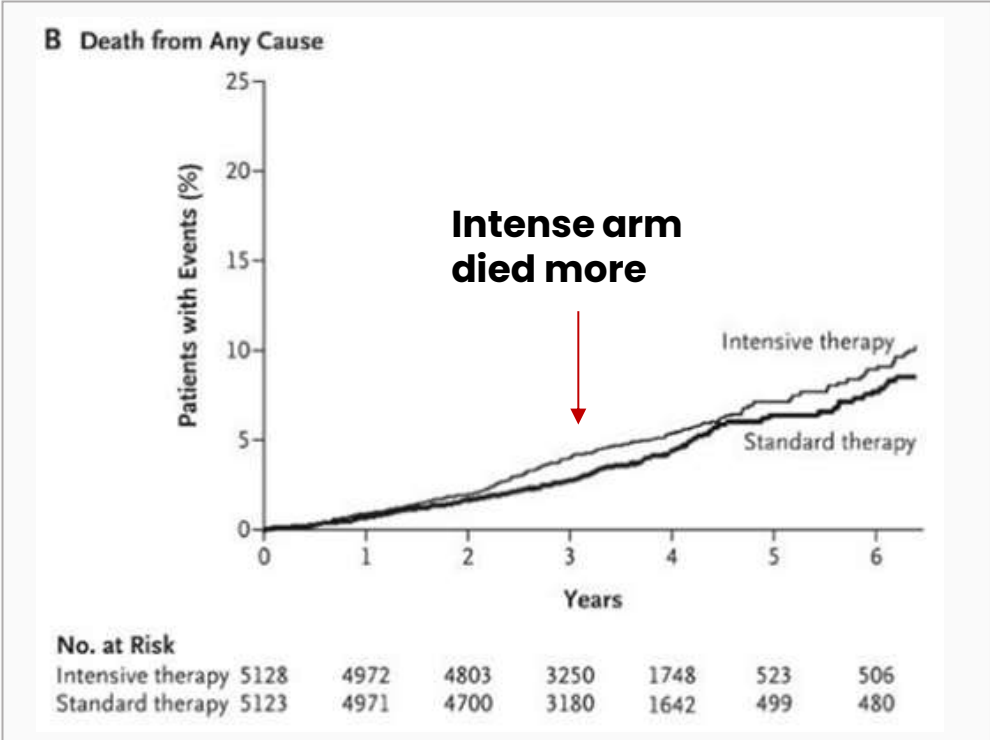


Approx 10,000 patients  
with type II diabetes



**ACCORD trial**  
**Does normalizing**  
**glucose decrease**  
**complications of**  
**diabetes?**

# Effects of Intensive Glucose Lowering in Type 2 Diabetes



Mortality	257 (5.01)	203 (3.96)	1.22 (1.01-1.46)	0.04
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# ACCORD trial

**77%**  
**on insulin**



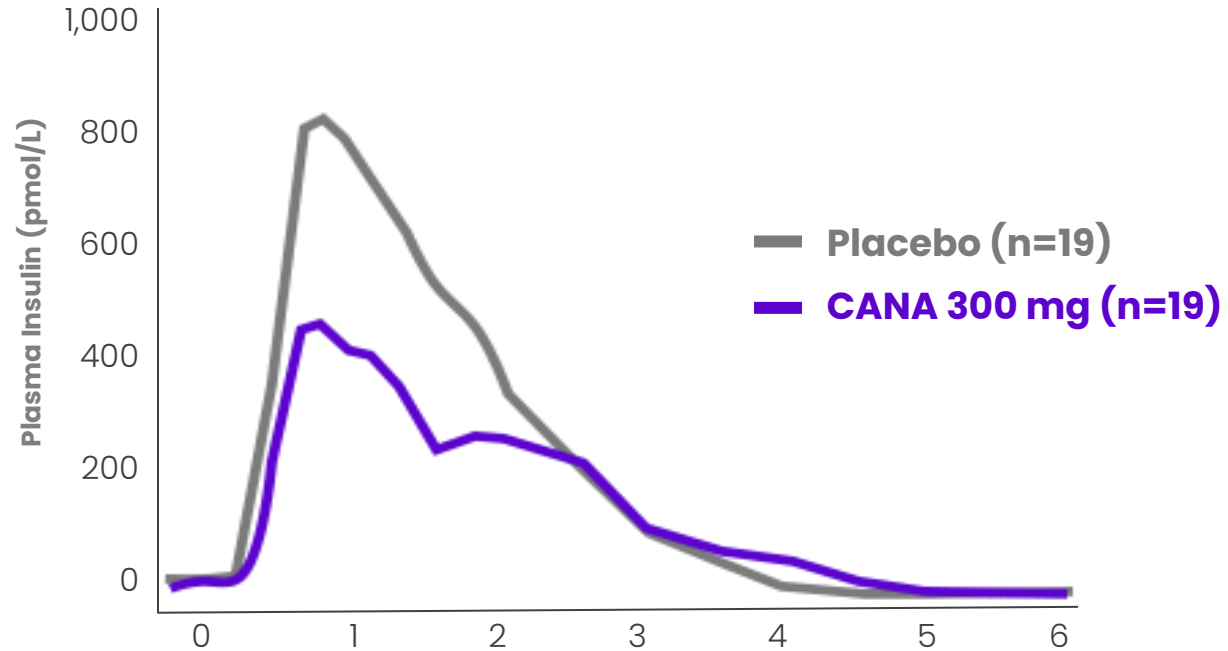
**Intensive  
arm**

**55%**  
**on insulin**



**Standard  
arm**

# New medications: SGLT-2 inhibitors decrease insulin levels

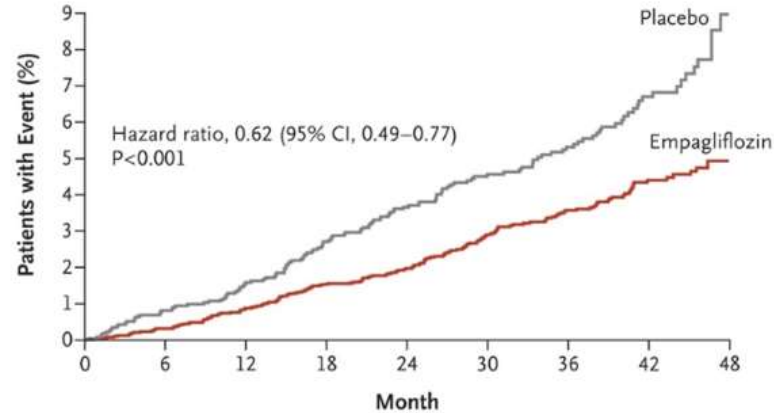


# New medications that DECREASE insulin levels

## › Improve mortality

### Empagliflozin

**B** Death from Cardiovascular Causes

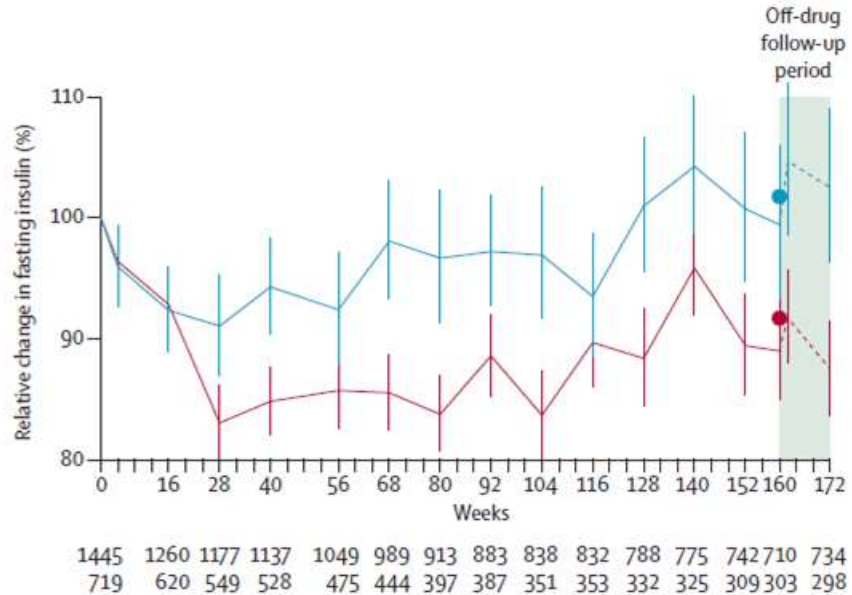


**No. at Risk**

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

# New medications: GLP-1 agonists decrease insulin levels

**Fasting Insulin  
0-172 weeks**

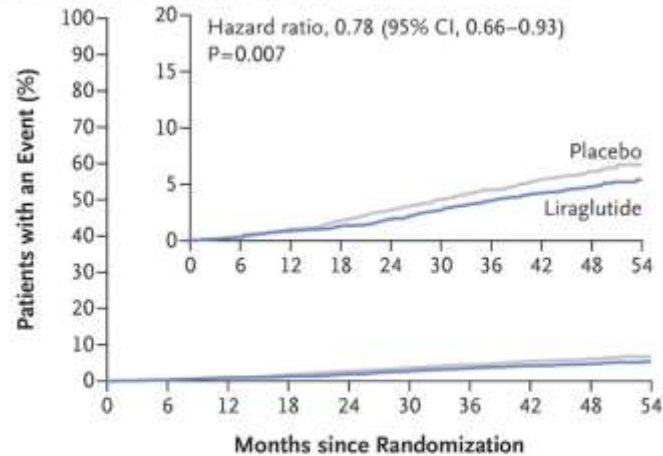


# New medications that DECREASE insulin levels

## › Improve mortality

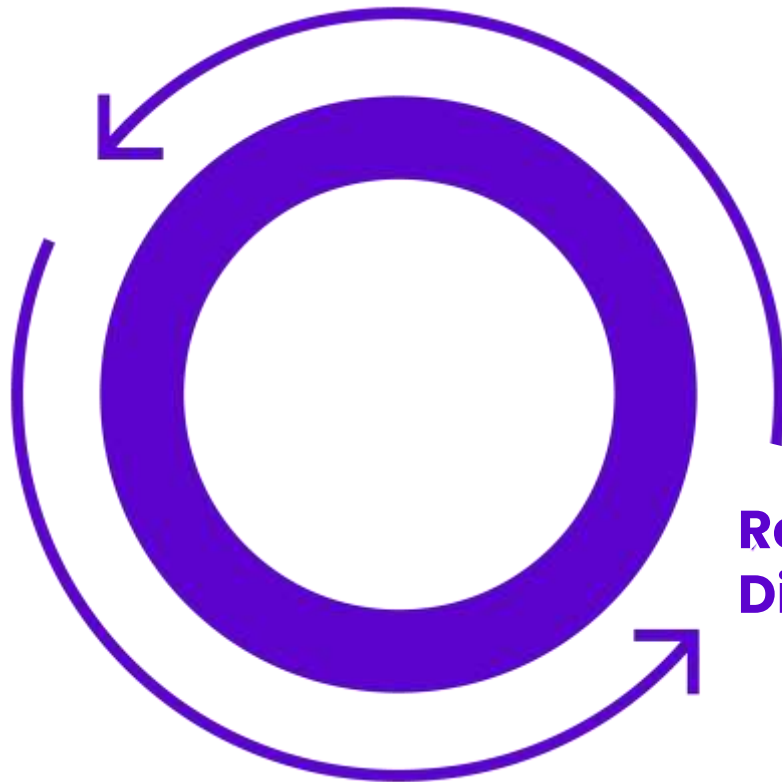
### Liraglutide

**B** Death from Cardiovascular Causes



**No. at Risk**

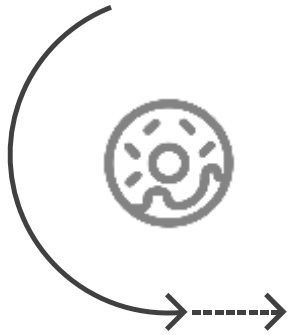
Liraglutide	4668	4641	4599	4558	4505	4445	4382	4322	1723	484
Placebo	4672	4648	4601	4546	4479	4407	4338	4267	1709	465



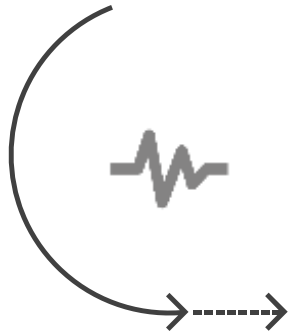
**Rethinking  
Diabetes Care**



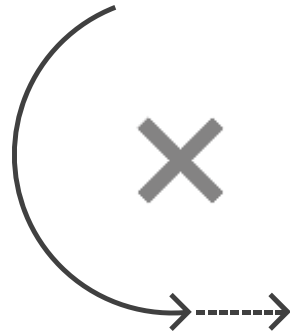
# Diabetes is caused by what we eat



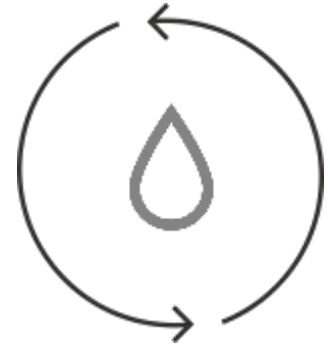
**Processed food**  
**Carbs**  
**Seed oils**  
**sugar**



**High**  
**Insulin**



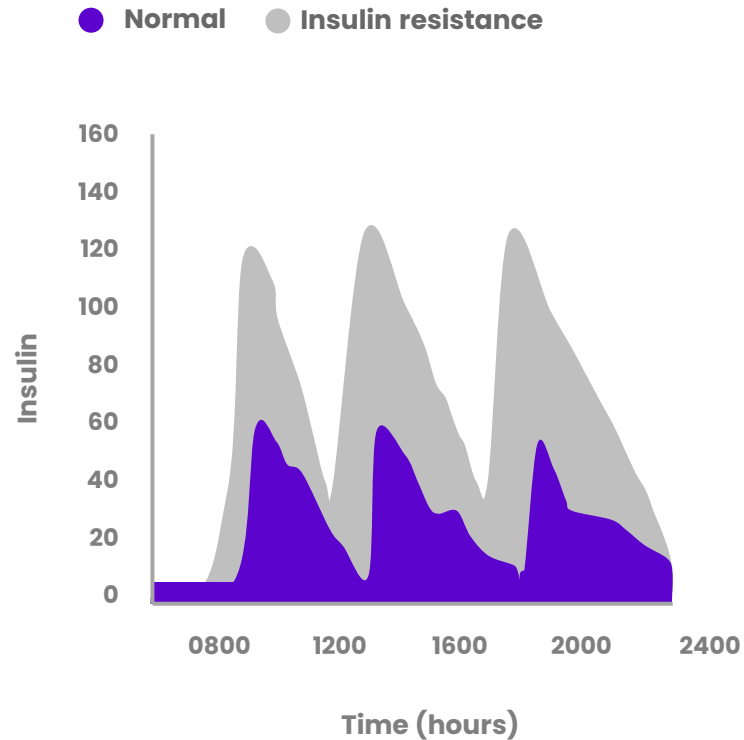
**Insulin**  
**resistance**



**Diabetes**

# Diabetes

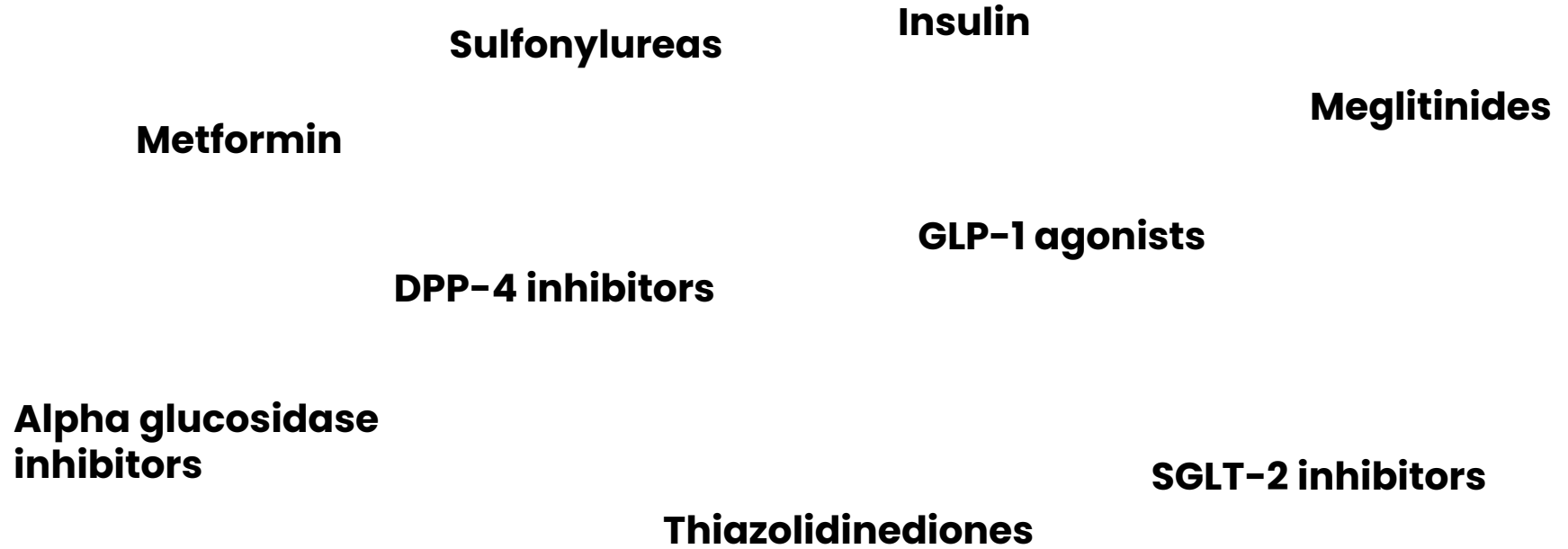
We must lower insulin levels in order to melt away the ectopic fat



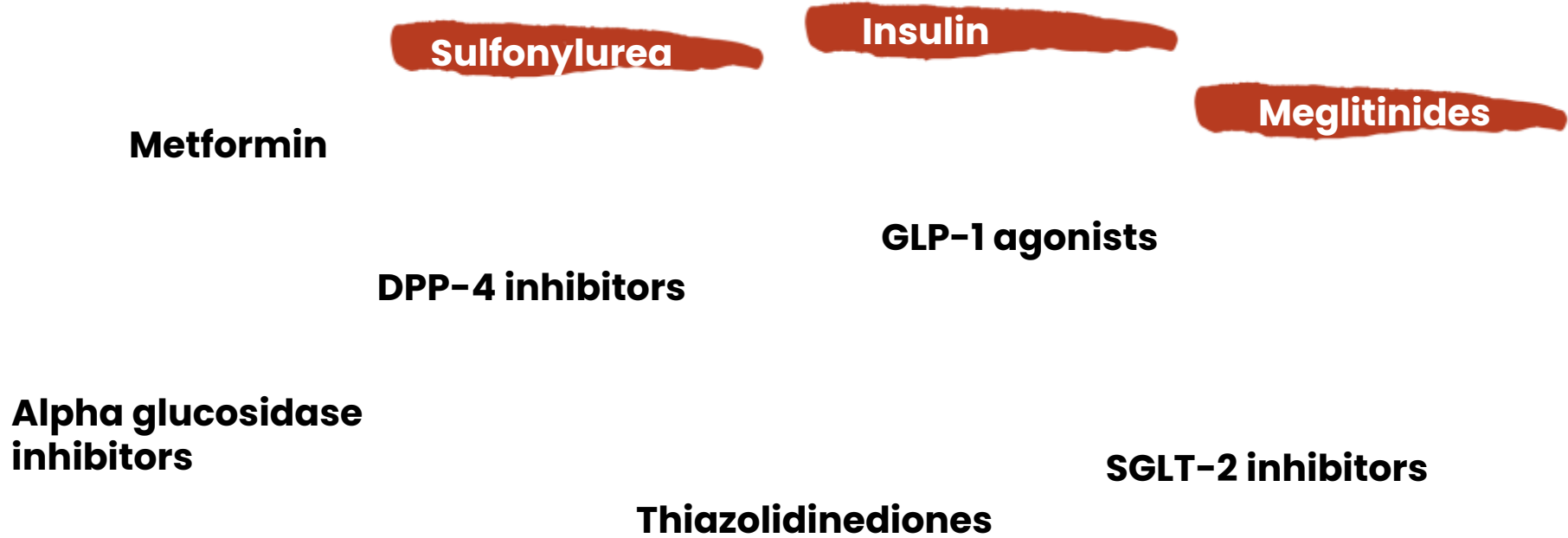
**Focus on eating  
real protein and fat**



# Medications for treatment of Type 2 Diabetes



# Medications for treatment of Type 2 Diabetes



## Remember HK?

**65** years old man  
Diabetes for 30 years + CVD



### Diabetes Meds: **A1c 6%**

- Long acting insulin 20 units
- Short acting insulin 5 units before each meal
- Metformin 850mg TID
- Victoza 1.8mg
- Actos 15mg
- Jardiance 12.5mg

### Hypertension **125/80**

- Norvasc 5mg
- Enalapril 20mg
- Cardiloc 2.5mg

### Cholesterol **LDL 75, HDL 55, TG 80**

- On lipitor 20mg

### Weight **92.6 kilos**

## Meet the new HK



### Diabetes Meds: **A1c 6%**

- Ozempic 1.0mg once a week
- Metformin 850mg once a day

### Hypertension **125/80**

- Enalapril 20mg

### Cholesterol **LDL 75, HDL 55, TG 80**

- On lipitor 10mg twice a week

### Weight **82.3 kilos**

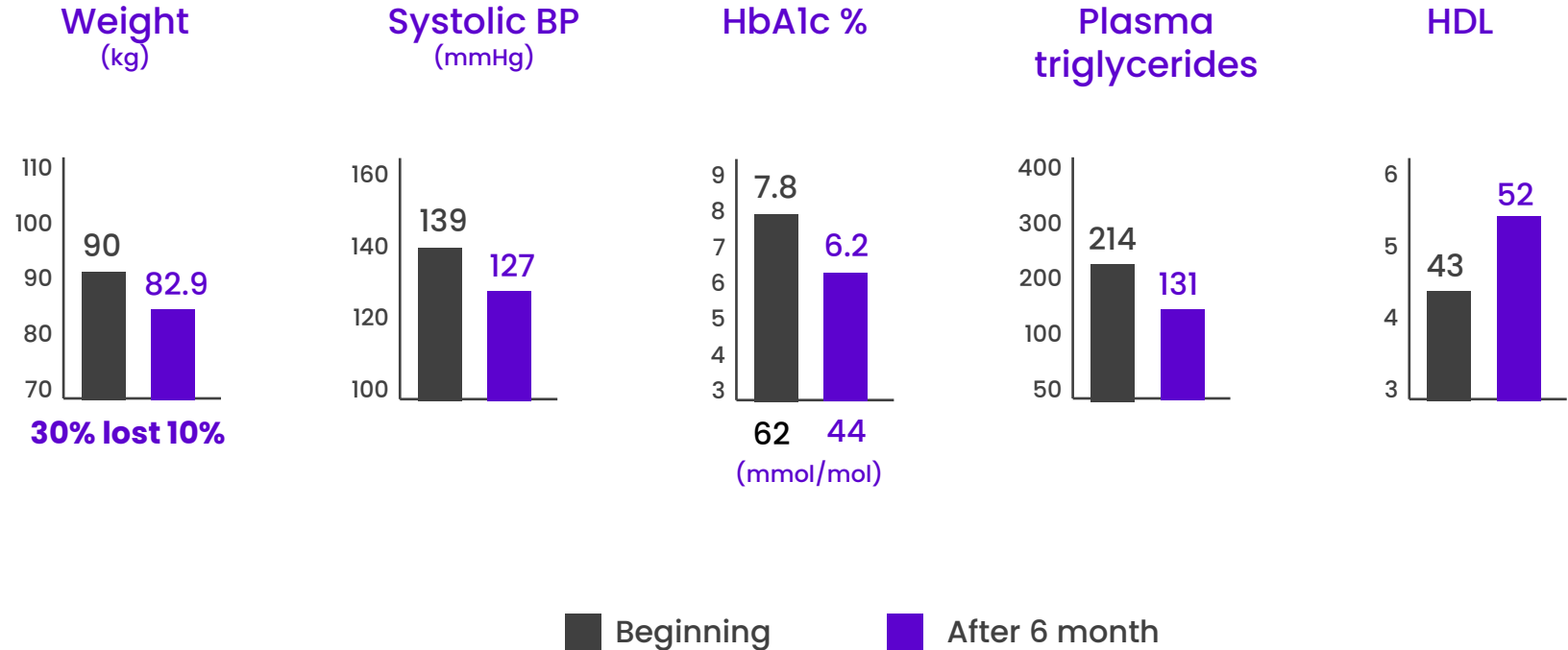
- Feels full of **energy**
- **One injection a week**
- No need to **check sugars**
- Is **exercising**
- **No more hunger**

# Glandt Center Findings from internal audit

- Cohort of 102 patients followed for 6 months
- Average age 61, 50% women
- Average 11 years with history of DM
- 27 patients on insulin at beginning → 1 patient after 6 months



# Glandt Center Findings from internal audit



## Why blood sugar control matters

Life years lost to diabetes: We estimate that for both Type 1 diabetes and Type 2 diabetes **each year with a HbA1c > 7.5% (58 mmol/mol) loses around 100 life days.**

UK National Diabetes Audit and Office of National Statistics data

# Glandt Center Findings from internal audit

**Out of 102 patients**

**Time 0**

**49 patients had an A1c >7.5%**

**Avg was 8.9% (73.8 mmol/mol)**

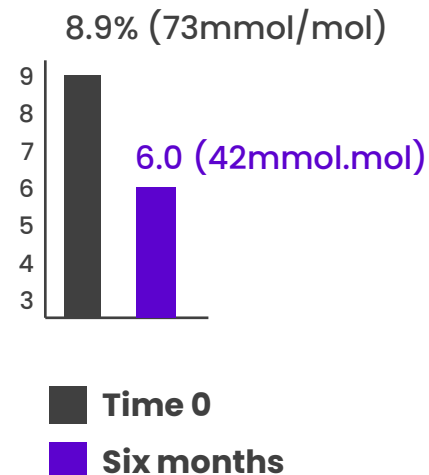
**Six months**

**45 had an A1c < 7.5%**

**Avg was 6% (42 mmol/mol)**

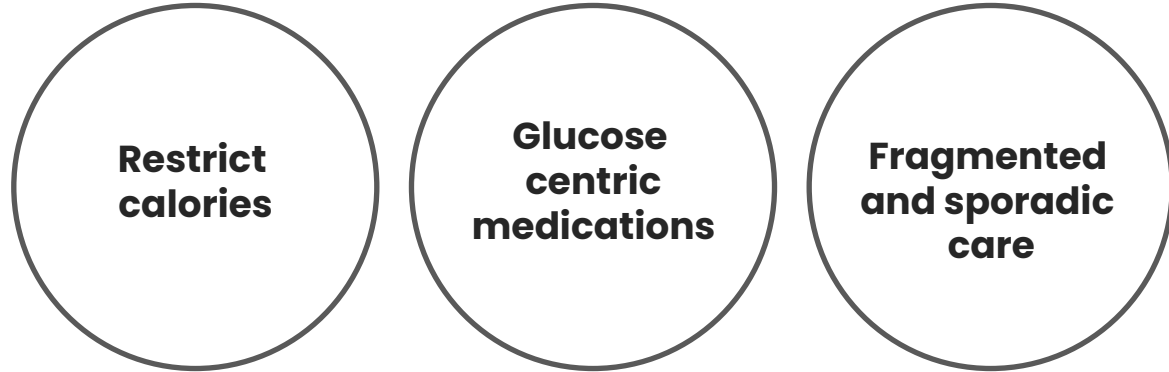
**92%**

**HbA1c**



**Glandt Center**  
for Diabetes Care

# Current paradigm: Type II diabetes is a progressive disease



**Dealing with the symptoms, not the root cause**

**PATIENTS GET SICKER**

# New paradigm: Type II diabetes is NOT a progressive disease



Treating the root cause

**PATIENTS GET HEALTHIER**

# Take Aways

Type 2 diabetes is a symptom of insulin resistance

Treat insulin resistance by changing diet

Treat diabetes by normalizing both insulin and glucose

# Thank You

**Dr. Mariela Glandt**

Founder & CEO, OwnaHealth

More info: [www.owna.health](http://www.owna.health)