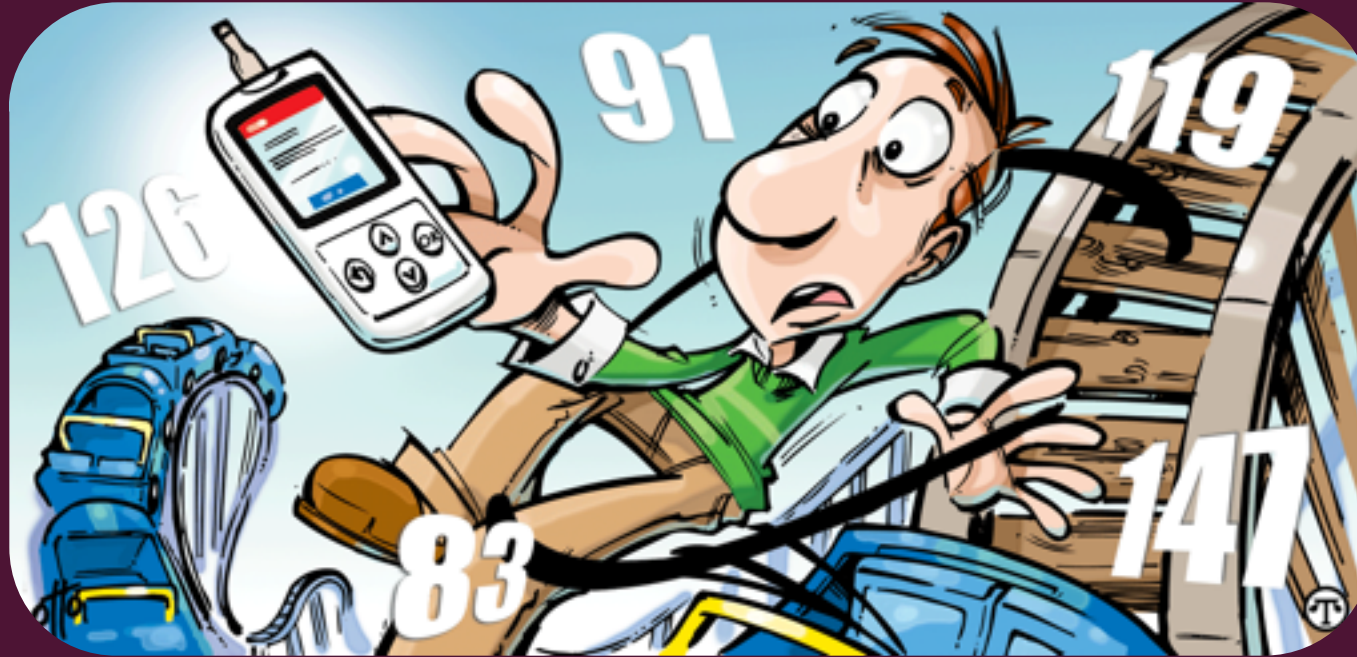


UNDERSTANDING DIABETES

King City
Guardian
Pharmacy

By: Aziza Amarshi, RPh,
RHN


KING TOWNSHIP PUBLIC
LIBRARY



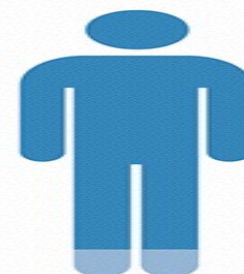
OUTLINE

- What is diabetes
- Understand what happens in the body when one gets diabetes
- Signs and symptoms of diabetes
- Long term effects of diabetes
- What does our diet have to do with it?
- Sugar roller coaster
 - What is it?
 - How do we get off it

WHAT IS DIABETES: THE SAD STATISTICS

- More than 9 million Canadians have diabetes or pre-Diabetes
- 1 in 4 Canadians have diabetes or pre-diabetes
- More than 20 people are diagnosed with the disease Every hour of every day globally
- 85-90% of cases are Type 2 Diabetes

Diabetes in Canada



More than
90%
of Canadians with diabetes have type 2, and up to
10%
have type 1

Source: Canadian Diabetes Association diabetes.ca

It's been shown that people at risk for type 2 diabetes are able to reduce that risk by losing 5% - 7% of their body weight.

It's estimated that



Canadians will be living with diabetes or prediabetes by **2020**



Experts believe that more than

50% of type 2 diabetes could be prevented or delayed **WITH** healthier eating **AND** increased physical activity

For more about preventing and managing diabetes, visit:



DIABETES STATISTICS

Diabetes: A global pandemic



Types of diabetes

Type 1 diabetes (or insulin dependent)

Caused by the destruction of insulin-producing cells, resulting in the body producing little, or no insulin.¹

78,000

Number of children developing type 1 diabetes, globally, every year²



Type 2 diabetes

Caused by insulin resistance and relative deficiency, where insulin produced by the body is not used effectively.³



Almost half of all people with type 2 diabetes are not aware that they have it⁴

Type 2 diabetes accounts for 85%-95% of all diabetes in high-income countries⁵

80%

of type 2 diabetes cases are believed to be preventable by changing diet and levels of physical activity⁶



WHAT IS DIABETES?

Diabetes is a Chronic disease characterized by high levels of sugar in the blood

Chronic & high levels of sugar
“SWEET BLOOD”

WHERE IS THIS SUGAR COMING FROM?



SHOULD WE AVOID ALL CARBOHYDRATES OR SUGAR CONTAINING FOODS?

- Flawed because
 - SUGAR/GLUCOSE is the most efficient energy source for body
 - BRAIN needs a steady supply of glucose to function
 - ALL METABOLIC PROCESSES in our body need glucose.

OUR BODIES **NEED** SUGAR (WHICH COMES FROM CARBOHYDRATES)

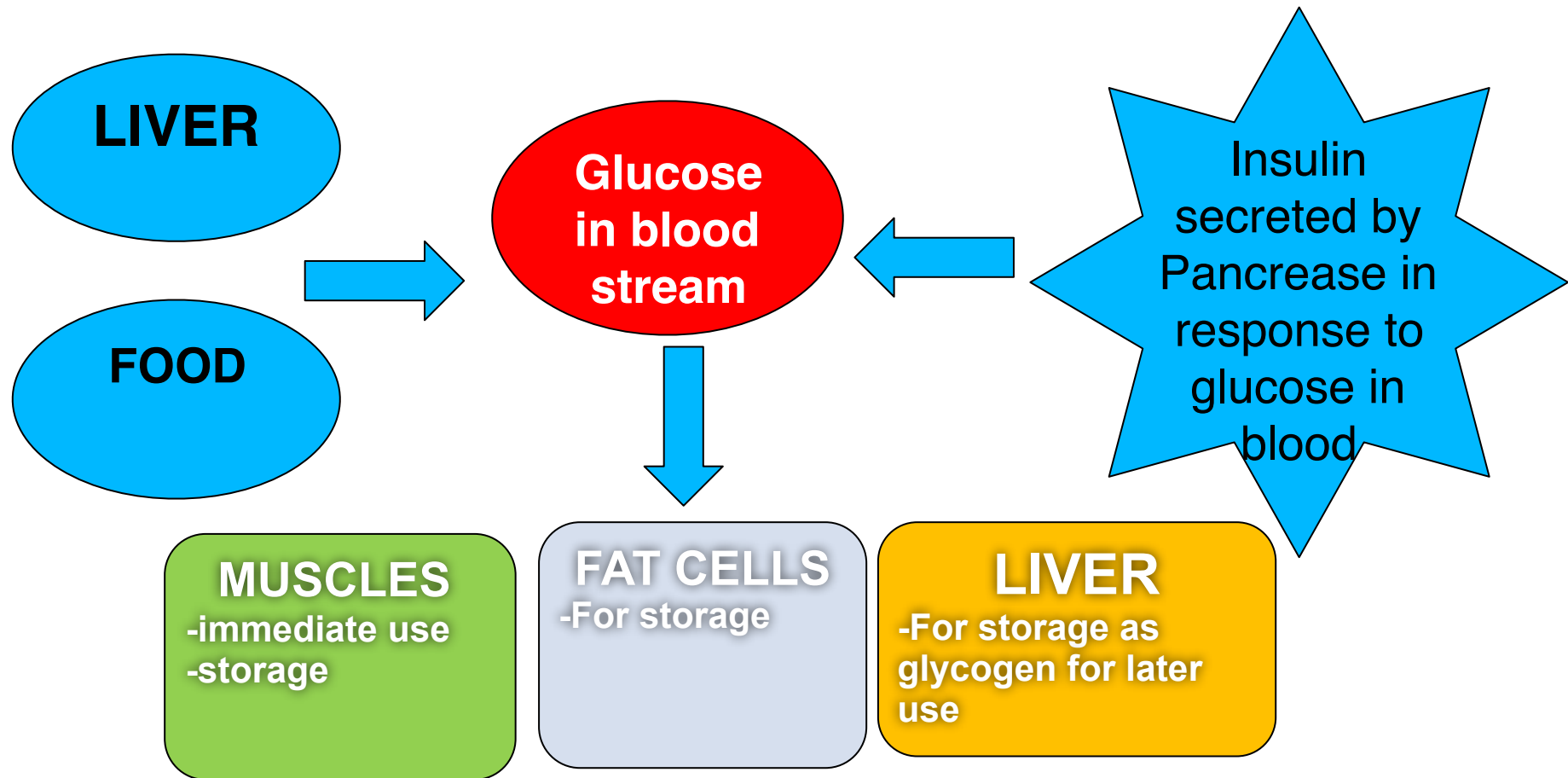
UNDERSTANDING DIABETES

BODY HAS A SYSTEM TO DEAL WITH SUGAR WE TAKE IN OUR DIET
IT PUTS IT RIGHT AWAY INTO CELLS ALLOWING ONLY A SMALL AMOUNT TO REMAIN IN BLOOD

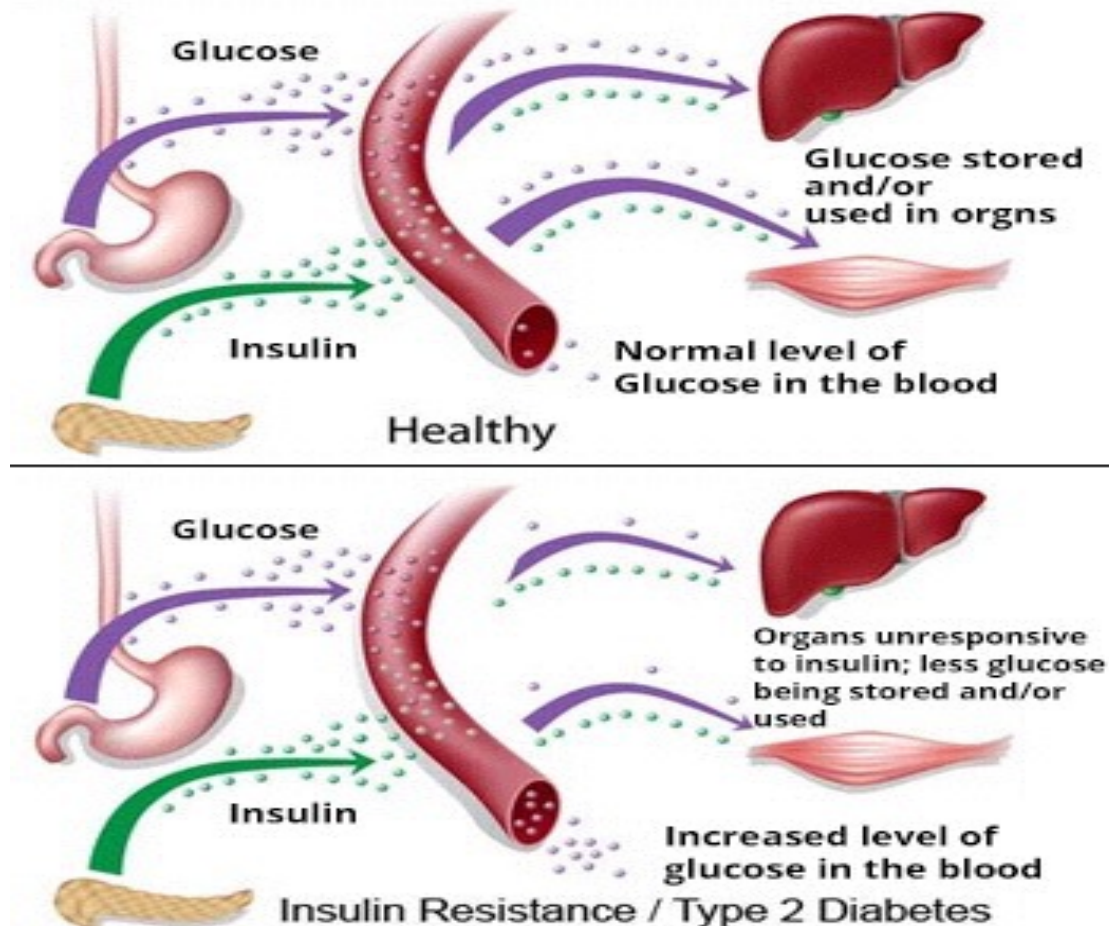
**BODY DOESN'T LIKE TOO MUCH SUGAR
FLOATING AROUND IN BLOOD**

PROBLEM HAPPENS WHEN THIS SYSTEM FAILS
DIABETES IS A RESULT OF OUR BODY'S FAILURE TO HANDLE GLUCOSE

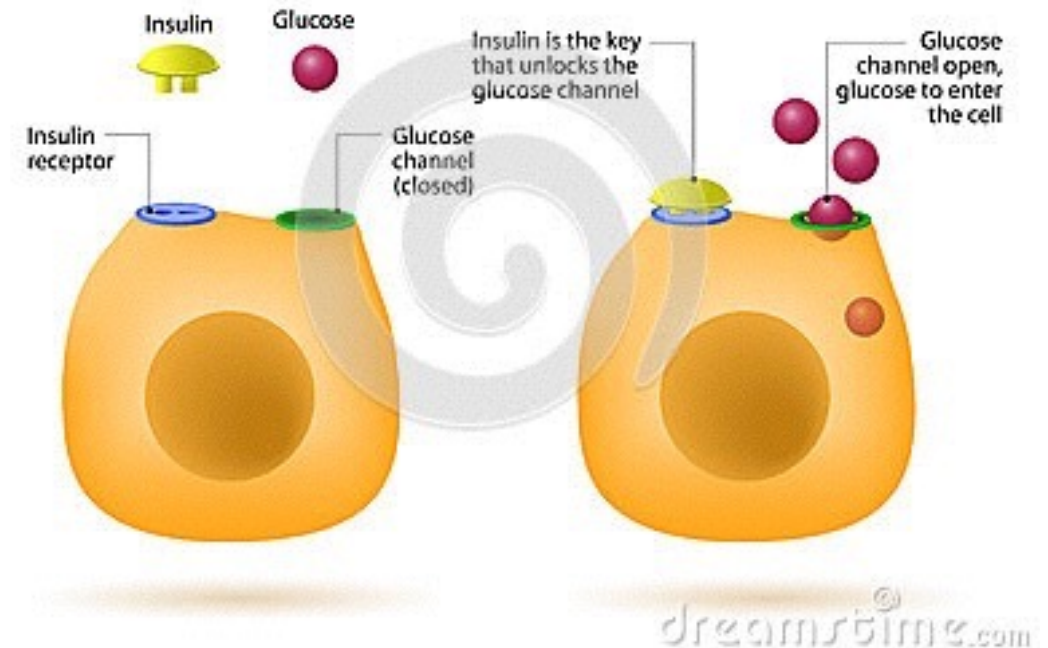
WHAT HAPPENS TO GLUCOSE/SUGAR?



WHAT HAPPENS WHEN OUR GLUCOSE MECHANISM FAILS



HOW DOES INSULIN WORK?

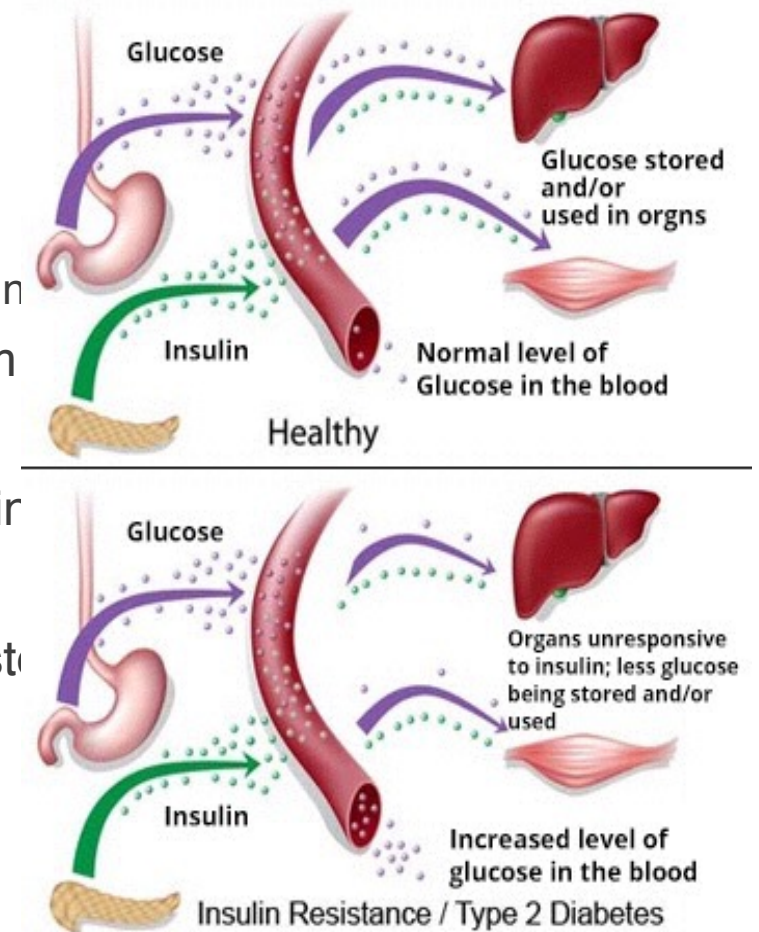


STEPS TO DEVELOPING DIABETES

■ A GENETIC DISPOSITION: IS IT NECESSARY?

1. Insulin resistance develops
 - Insulin resistance = reduced sensitivity of fat and muscle cells to insulin
2. Glucose cannot get into cells—remains trapped in the bloodstream
3. Pancreas overcompensates and produces more insulin.
4. Insulin producing cells eventually tire out and produce decreased insulin.
5. Insulin prevents liver from releasing stored glucose.

So when levels of insulin drop liver starts producing glucose from storage



STEPS TO DEVELOPING DIABETES

End Result

**HYPERGLYCEMIA—TOO MUCH SUGAR IN THE BLOOD
STREAM**

INSULIN RESISTANCE

Cells do not recognize
insulin and do not allow
sugar to get in

INSULIN DEFICIENCY

Pancreas do not make
enough insulin

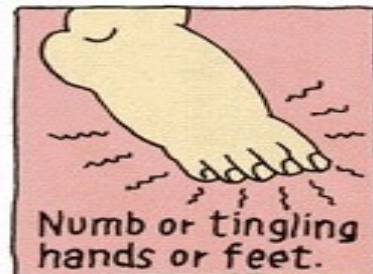
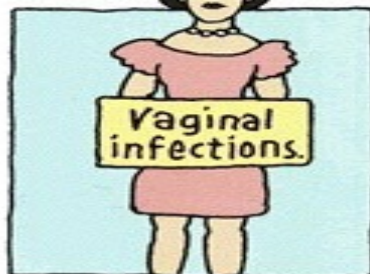
**GLUCOSE
PRODUCTION BY
LIVER**

HOW DO YOU KNOW THERE IS TOO MUCH SUGAR IN YOUR BLOOD STREAM

THREE WAYS OF FINDING OUT YOUR BLOOD GLUCOSE STATUS

1. Symptoms
2. Fasting Blood glucose levels obtained via home blood glucose monitor or through a lab
3. HbA1C% levels obtained via lab

SYMPTOMS OF DIABETES



DIAGNOSIS OF PREDIABETES & DIABETES

TEST	RESULT	CATEGORY
FPG (no calories for atleast 8hr)	6.1 – 6.9	IFG (impaired fasting glucose)
	≥7.0	DIABETES
2hPG in a 75 g OGTT (mmol/L)	7.8 – 11.0	IGT (impaired glucose tolerance)
	≥11.1	DIABETES
A1C (%)	6.0 – 6.4	PREDIABETES
	≥6.5	DIABETES
Random PG (mmol/L)	≥11.1	DIABETES

BELOW 6----NORMAL
BETWEEN 6-7-----PREDIABETES
ABOVE 7-----DIABETES

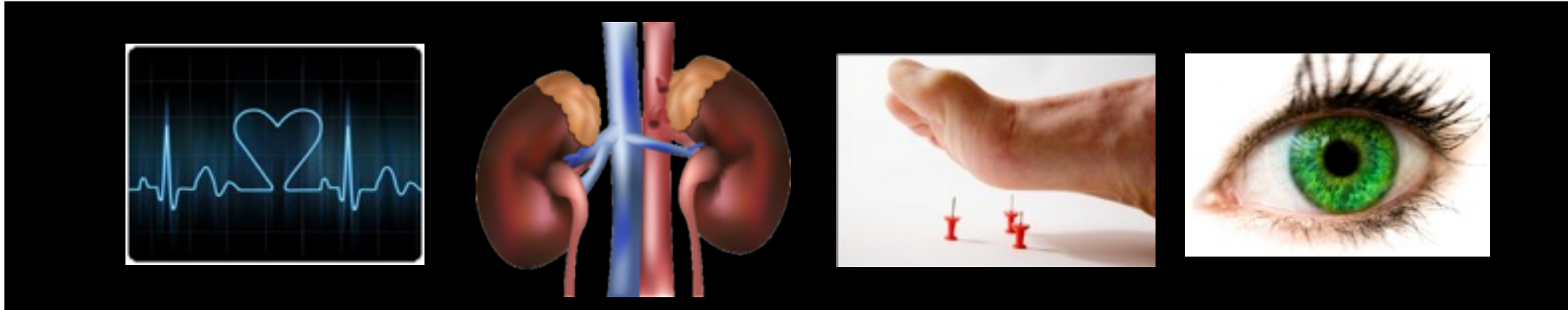
SO WHAT?



WHO CARES?

Complications of diabetes

Excess sugar in the blood causes many problems in other parts of the body



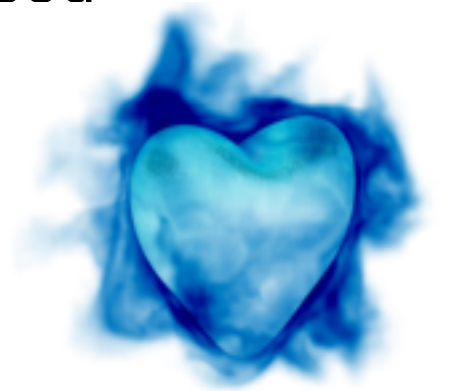
Most of these problems can be *prevented or delayed* by controlling your sugar levels, through:

DIET, LIFESTYLE, and MEDICATION

Heart problems

High blood pressure

- As cells become resistant to **insulin**, it remains unused and **collects in the blood**
- Excess insulin promotes the kidneys to keep **more sodium (salt)** in the blood
- This could be one of the causes of why high blood pressure occurs in 8 out of 10 type 2 diabetics



Heart problems

Cholesterol / Heart Attack / Stroke

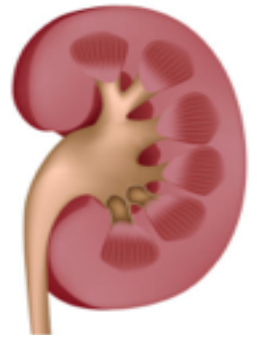
- Risk of heart attacks 3x higher in diabetics than normal population
- Excess glucose in blood vessels damage the lining of blood vessels—leads to plaque formation and narrowing of artery.
- Plaques can then break off, get stuck in smaller arteries, stopping blood flow. This causes a heart attack if it gets stuck in heart vessels or stroke if it gets stuck in brain



Kidney problems

Dehydration / Kidney failure

- Kidneys: remove unused sugar (and toxins) from your blood
- Excess blood sugar levels overwhelms the kidneys
- The kidneys draw fluid from the blood, and other cells to dilute the excess sugar and eliminate it via the urine
- This leads to **dehydration** which hurts the kidneys and reduces their effectiveness, and may lead to sudden **kidney failure**
- **Diabetes is the most common cause of kidney failure**
- Can be prevented by maintaining normal sugar levels



Eye problems

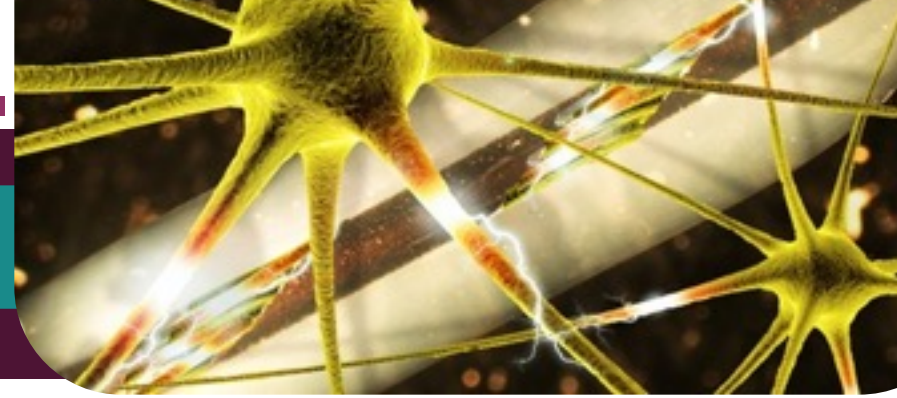
Retinopathy / Blindness

- The **kidneys** have to **work harder** to remove excess sugar from the blood
- They resort to **pulling fluid** from the **eyes** to remove excess sugar
- Less fluid in the eyes causes blurred vision and
 - retinopathy (damage to retina blood vessels)
 - blindness (if left untreated)



Nerve problems

Nerve problems

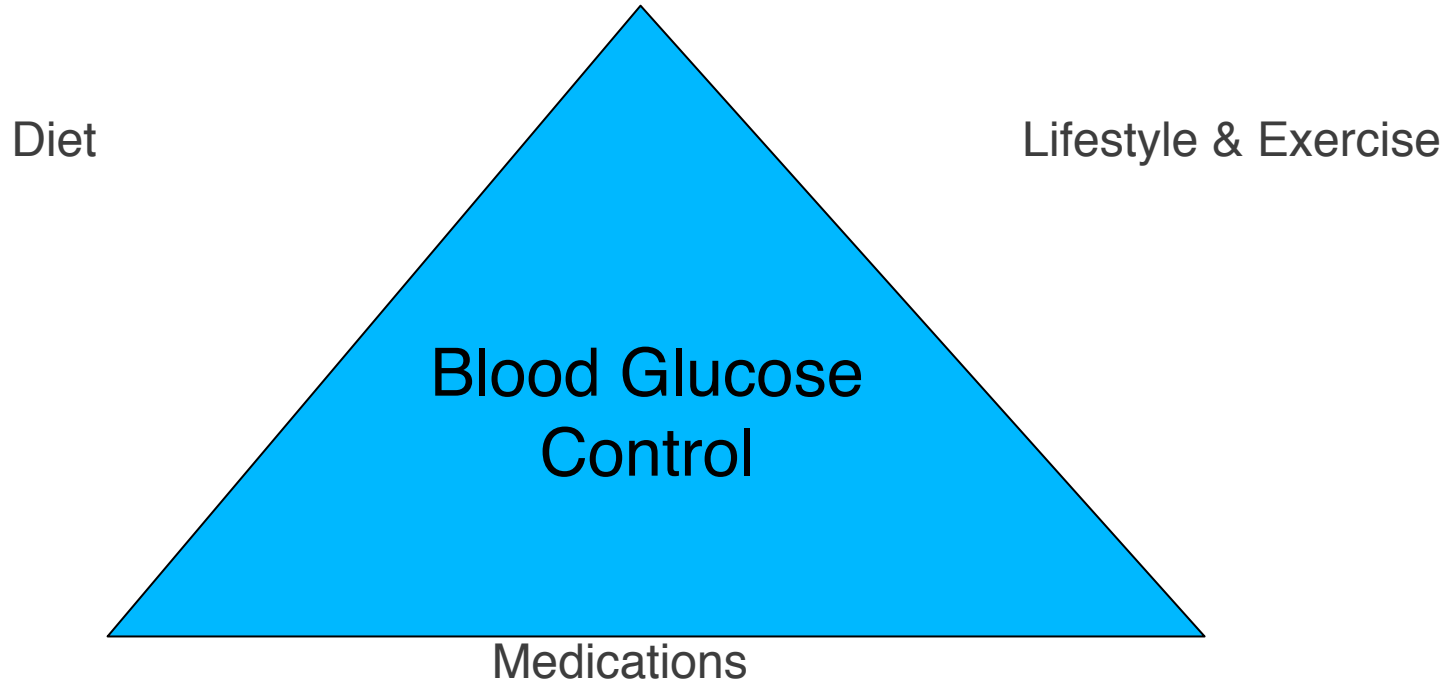


- >50% of people with diabetes develop neuropathy
- Excess blood sugar **prevents** nutrients and oxygen from nourishing **nerve** cells, which then **starve and die**
- Can no longer feel touch, pain, heat, and cold
- Leads to:
 - **foot problems** (unable to feel cuts/scrapes) and infection
 - **stomach problems**
 - **numbness, tingling, pins and needles**

WHAT DOES BETTER SUGAR CONTROL MEAN?

- Studies show that keeping blood glucose levels closer to normal reduces complications to small vessels by 25% to 75% (thus reducing eye, kidney and nerve damage)
- A 1% reduction in HbA1c (ex from 8% to 7%)
 - 30% reduction in microvascular complications (nerve damage, eye etc)
 - 18% reduction in heart disease
 - 25% reduction in diabetes related mortality

DIABETES: A LIFESTYLE DISEASE

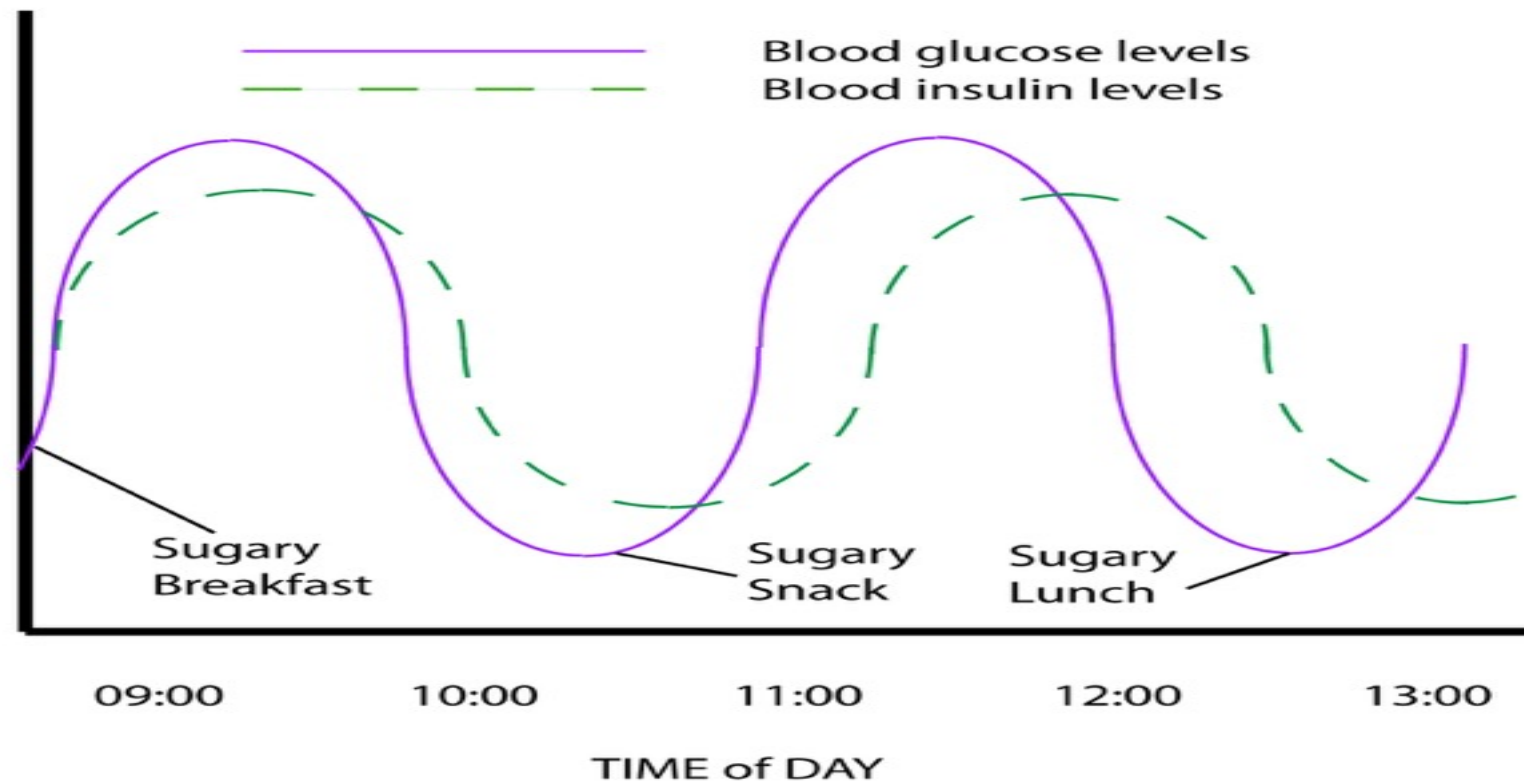


THE SUGAR ROLLER COASTER

WHAT IS ITS ROLE?

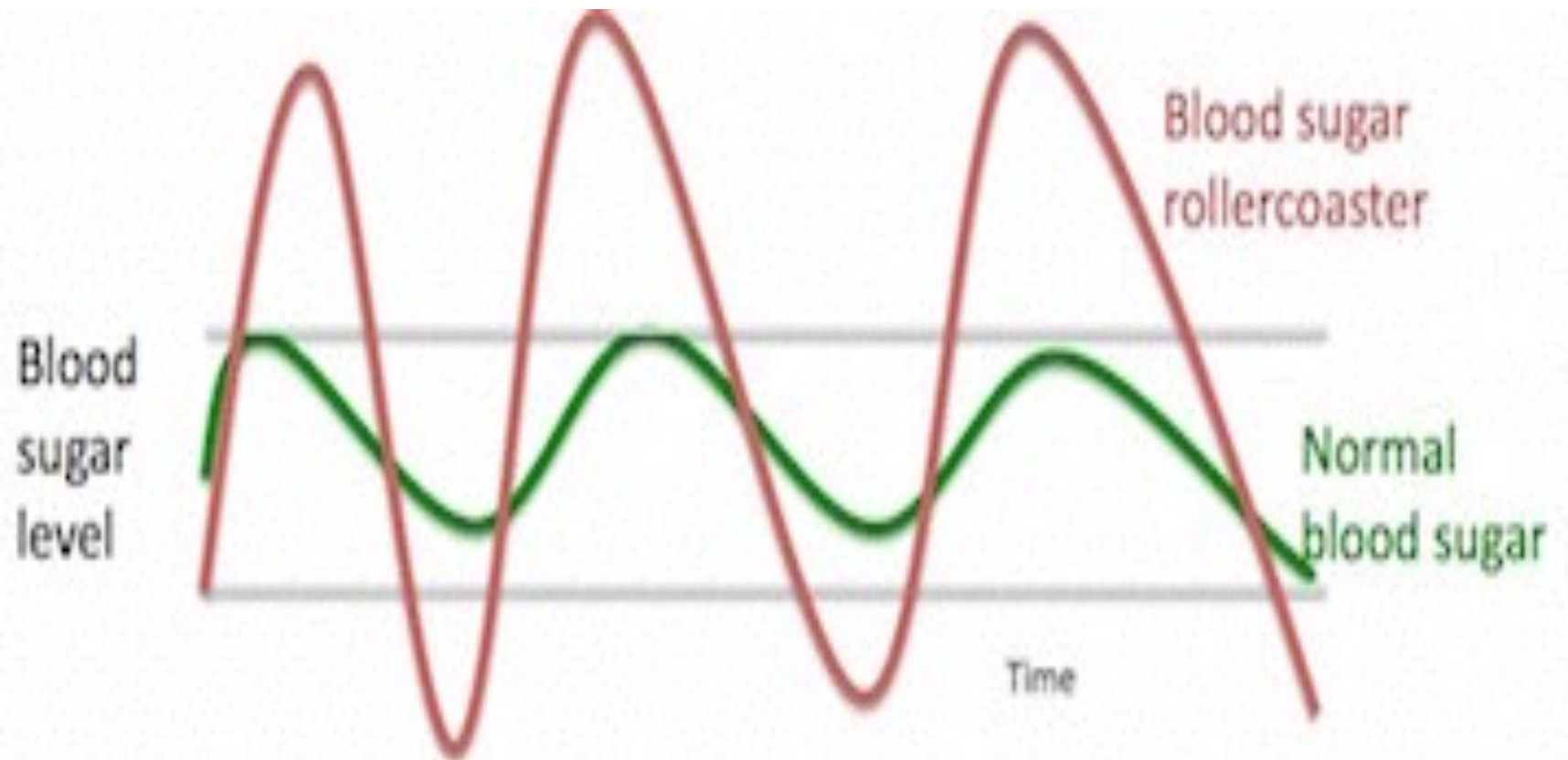


WHAT IS A SUGAR ROLLER COASTER?



Breakfast: Bagel and Coffee with sugar
Snack: coffee & cookie
Lunch: pizza
Snack: coffee and muffin
Dinner: chicken pasta with garlic bread

WHAT BLOOD LEVELS SHOULD WE BE AIMING FOR?



HOW IS THE SUGAR ROLLER COASTER LINKED TO DIABETES

TWO MECHANISM HYPOTHESIZED

■ INSULIN RESISTANCE

- Inability of the cells to recognize insulin: the lock changes, key doesn't fit

■ PANCREATIC EXHAUSTION

HYPERGLYCEMIA

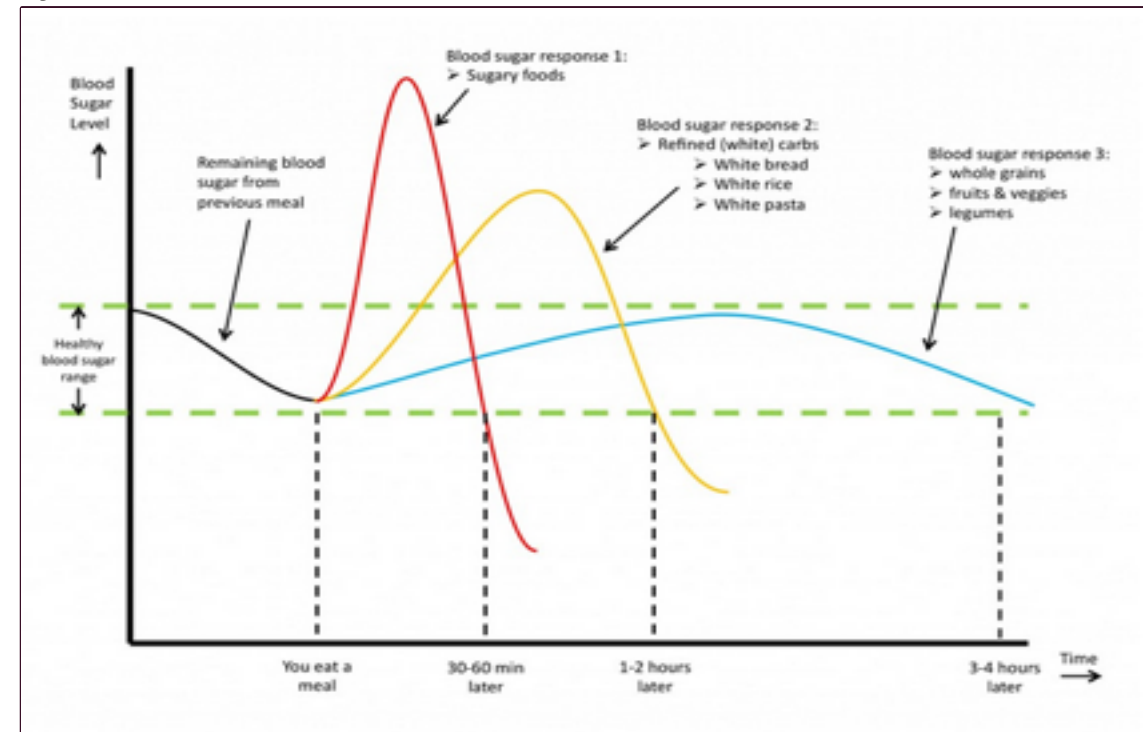


INCREASE IN INSULIN



PANCREATIC EXHAUSTION

DECREASE IN INSULIN



CONCLUSION

- For non-diabetics:
 - The consumption of slowly absorbed carbohydrates produce lower peaks are advantageous in prevention
- For diabetics:
 - Low glycemic index diet improves
 - Sugar control
 - HBA1c