



Upper Grand
Family Health Team

Ontario 

Introduction to Pre Diabetes/Diabetes

UPPER GRAND FAMILY HEALTH TEAM



It's great to be in the driver's seat, thanks to my diabetes education

<number>



Upper Grand
Family Health Team

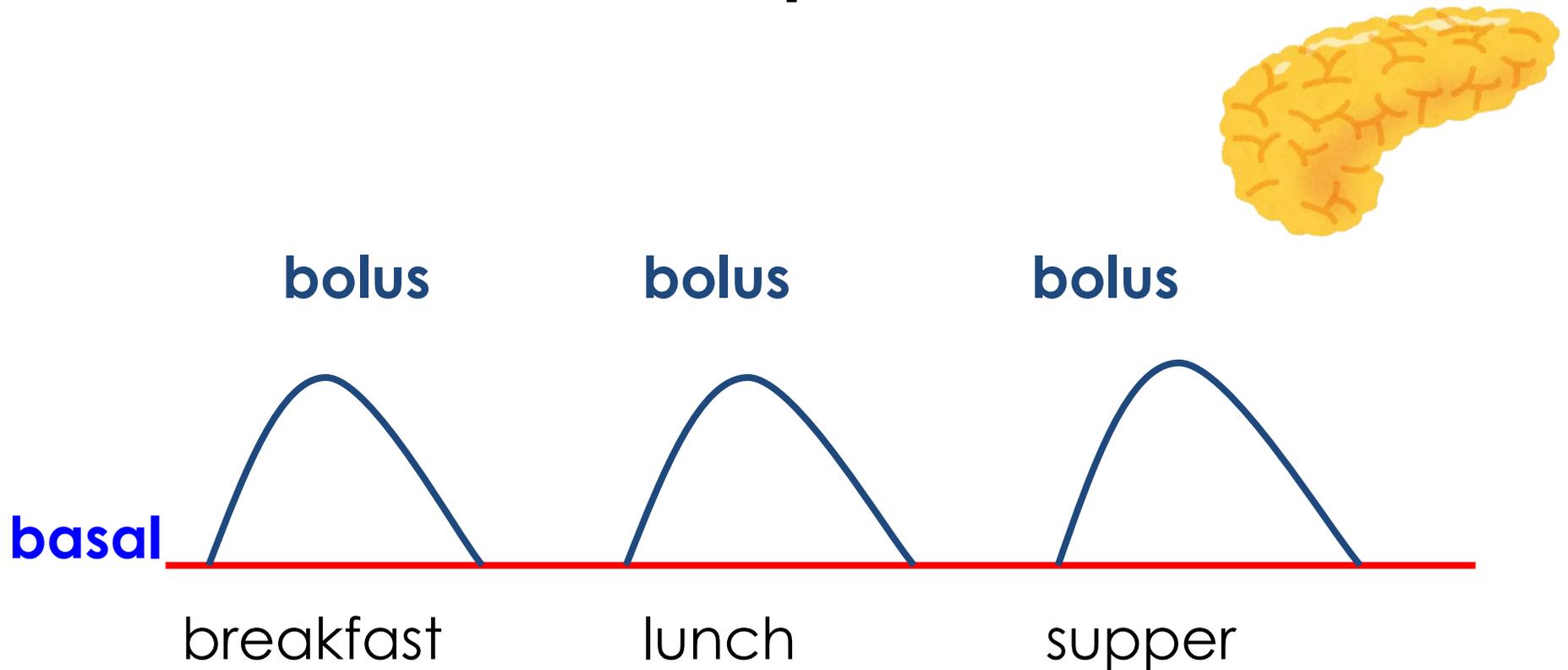
Goals for this class ...

1. Learn more about diabetes
2. Learn how nutrition and lifestyle are the keys to health
3. What you can do to manage your diabetes

What is diabetes?

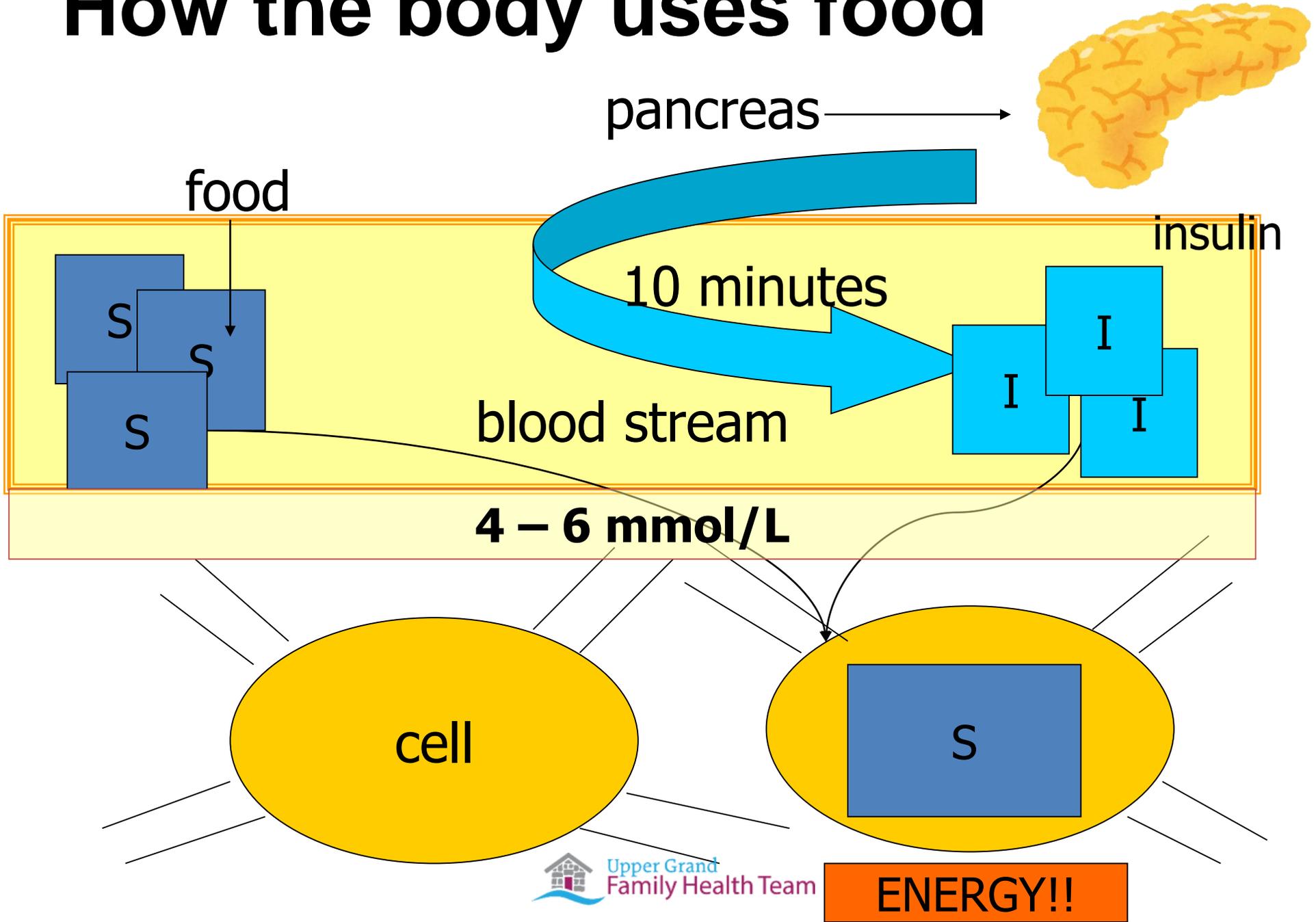
- Diabetes is a disease in which the body is not able to use sugar/carbohydrates properly

Normal insulin peaks

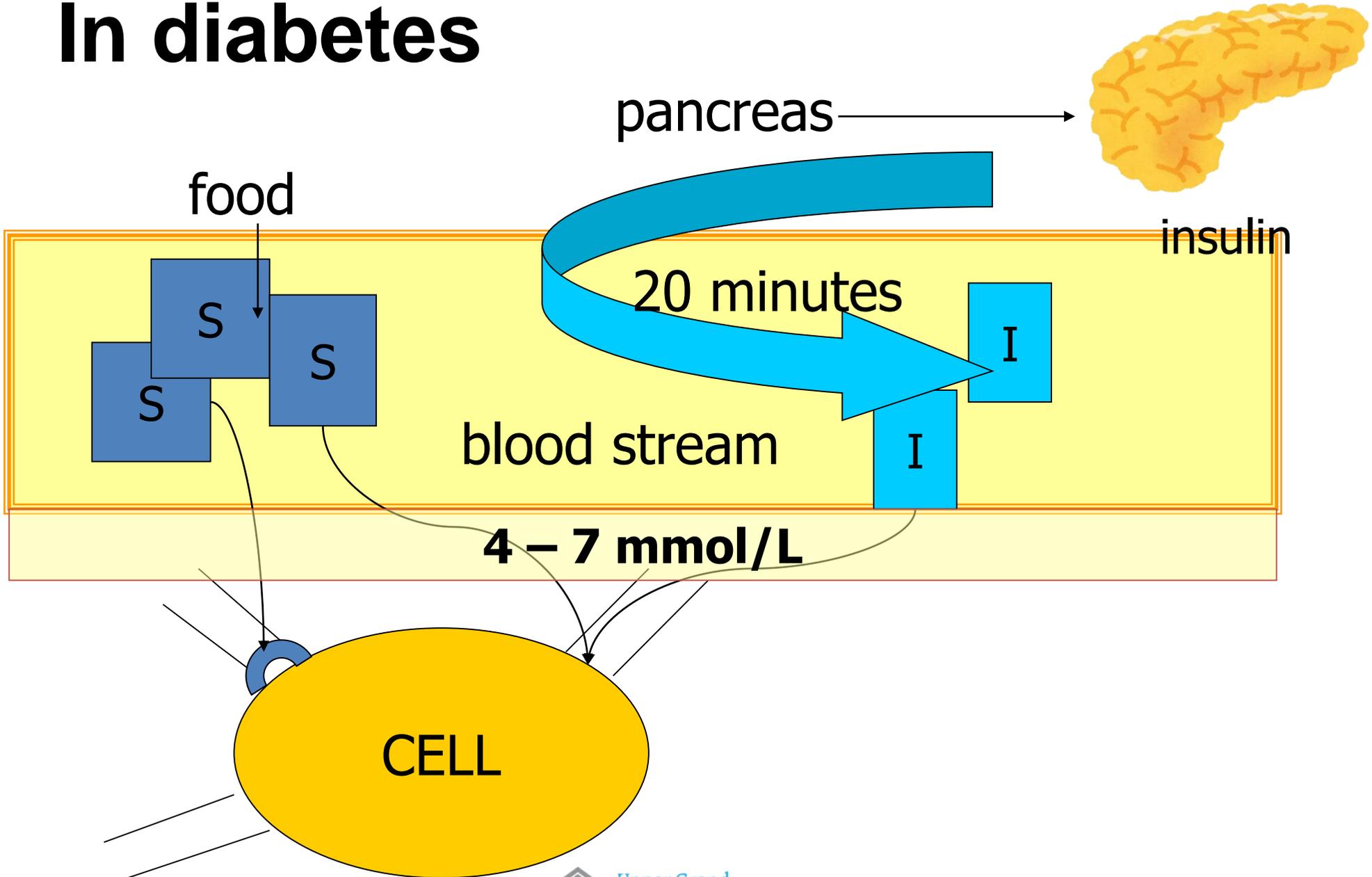


Average blood sugar 4.0 to 6.0 mmol/L

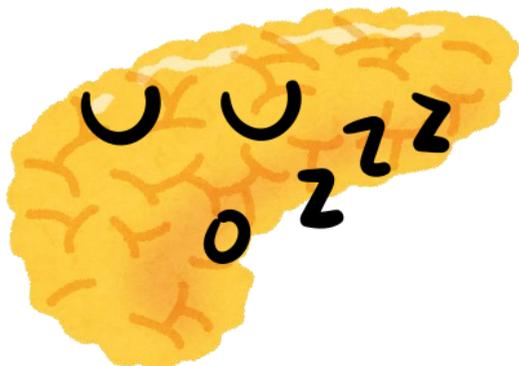
How the body uses food



In diabetes



What happened?



A Pooped out Pancreas
(**insulin deficiency**)

A Leaky Liver



A Door with Rusty Hinges



Insulin Resistance

Types of diabetes

Gestational



Type 1



Pre Diabetes
&
Type 2



Do I have prediabetes?

Yes, if you have higher-than-normal blood sugar

- Fasting Blood Glucose: 6.1 – 6.9 mmol/L
- 2 hr Blood Glucose: 7.8 – 11.0 mmol/L
- Hemoglobin A1c: 6.0-6.4%

Not all people with Pre-Diabetes go on to develop diabetes, but you are at higher risk

Do I have Type 2 Diabetes?

**The guidelines say,
you have diabetes if you have:**

2 fasting blood sugars over 7.0 mmol/L

or

Random blood sugar over 11.1 mmol/L

or

A1c \geq 6.5%

A1C% Glycosylated Hemoglobin

Your glycosylated hemoglobin test shows your blood sugar control over the past 2 to 4 months.

Average blood sugar level (mmol/L)

Conversion Chart¹

A1C%

Record your A1C% Test Results

19.5

17.5

15.5

13.5

11.5

9.5

7.5

12%

11%

10%

9%

8%

7%

6%

Date

A1C%

Date	A1C%

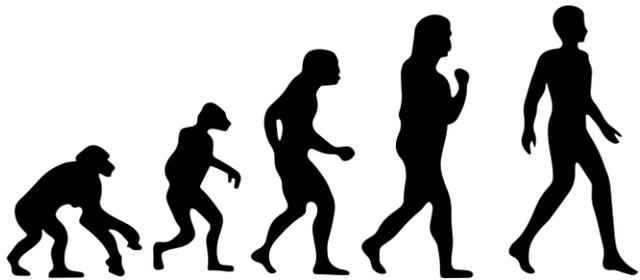
1. Rohlfing CL, Wiedmeyer H-M, Little RR, et al. Defining the relationship between plasma glucose and HbA1c: analysis of glucose profiles and HbA1c in the Diabetes Control and Complications Trial. Diabetes Care. 2002;25:275-278. ME171 Rev3 01/04

Precision™

What Increases my risk?

- family history
- over age 40
- ACEs (adverse childhood events)
- Overweight* (chicken vs egg)

Diabetes is Born in the Gap Between Primitive Physiology and Modern Lifestyle



- Feast or famine
- Hard labor
- Active pursuits
- Goal was survival

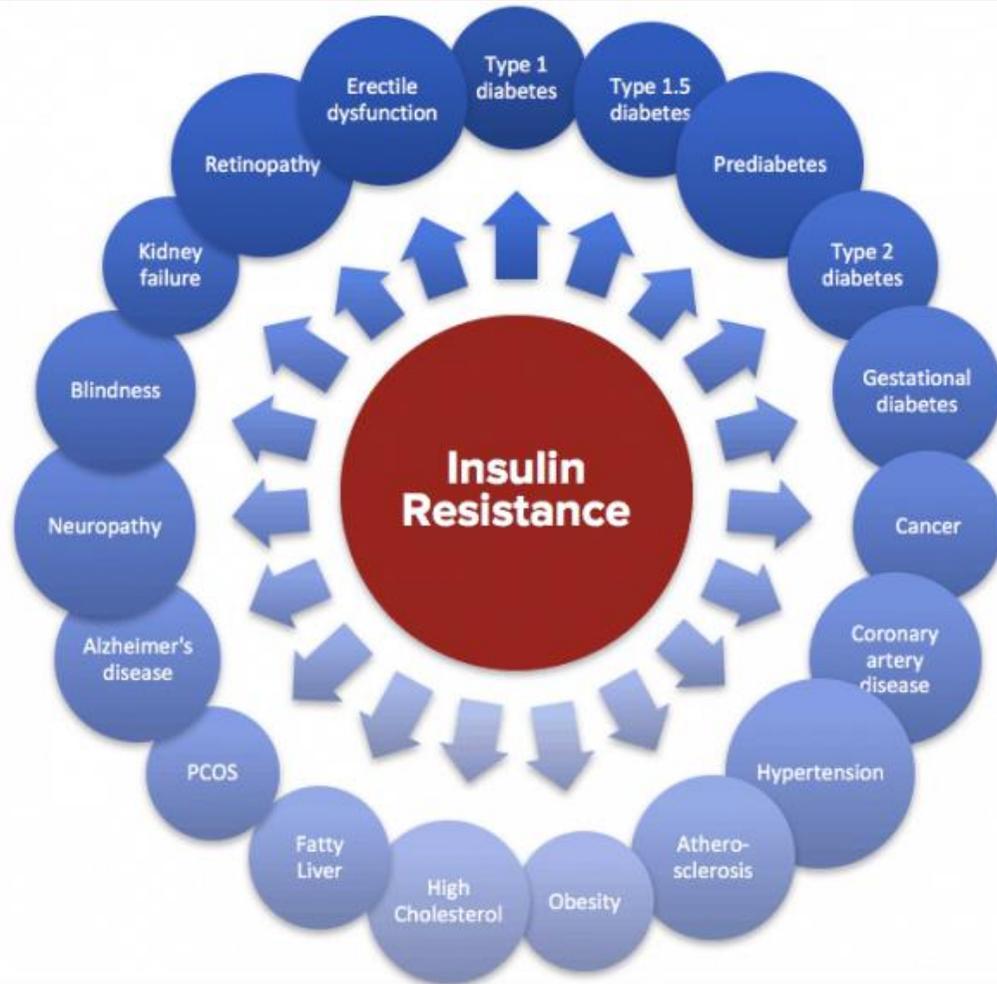
- Abundant food
- No famine
- Little physical work
- Abundant leisure
- Goal is consumption and “taking it easy”

Should I worry?

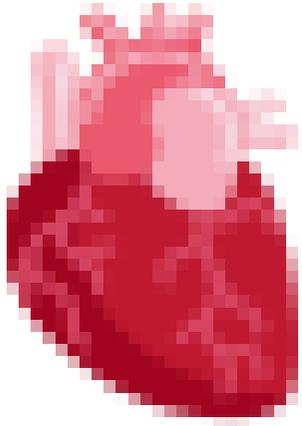


Yes...Diabetes is a serious,
progressive disease and changes
are **SILENT**

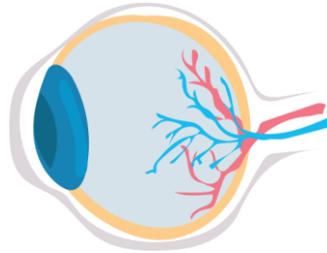
Insulin Resistance



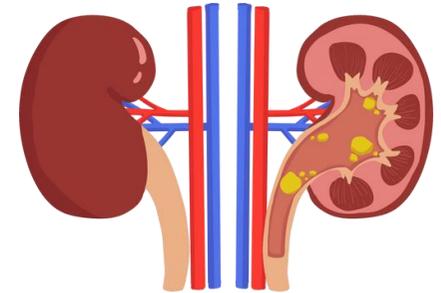
COMPLICATIONS OF DIABETES



Heart Disease



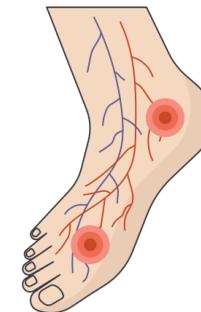
Eye Disease
(Retinopathy)



Kidney
Disease
(Nephropathy)



Stroke



Nerve Damage
(Neuropathy)

Preventing Complications

- LDL < 2.0 mmol/L
- BP < 130/80
- Blood Glucose Levels:
 - Before Meals: 4-7 mmol/L
 - 2 hrs after meals: 5-10 mmol/L
 - A1c: ≤ 7.0 (6.5% if possible without low BGs)

Good News:

If blood sugars are well controlled, you will be 50 to 70% less likely to have complications

A healthy lifestyle can delay or prevent the progression to diabetes by up to **58%**

- Healthy eating
- Physical activity
- Losing 5-10% of your body weight
- Dealing with stress



Monitoring

- Most people should test at least once daily to see where they may be too high (or too low- rare unless taking meal time insulin)
 - Pick 1 meal/day: do both before and 1.5-2 hrs after
 - First thing in morning before you eat
 - Bedtime
- Helps to understand how changes in food, activity or medication can affect your blood sugar
- Bring your meter and log book to future appointments



So what can I do?

- regular blood tests at the lab every 3 – 6 months
- self blood sugar monitoring using a home meter

Know your blood sugar targets:

Pre-meals: 4-6mmol/L

2 hours after meals: less than 8mmol/L

Signs and symptoms of high blood sugar



- Fatigue and drowsiness



- Increased thirst



- Frequent need to urinate



- Headaches

Blood Glucose Levels & Symptoms

Blood Sugar Level	Blood Sugar mmol/L	Symptoms
High	>19	Thirst, fatigue, weakness, weight loss
	15-17	Frequent urination, blurred vision
Caution	13	
	10-12	
Optimal	4-10	
Low	<4	Headaches, nausea, irritability, hunger, weakness, shaking, sweating, confusion

How do we manage?



Physical Activity: Target 150 mins/wk

Type	Recommendations	Example
<p>Aerobic – especially type 2</p>	<ul style="list-style-type: none"> • 150 minutes of moderate-intensity exercise each week/30 minutes per day. • Spread out over at least 3 non-consecutive days. • Gradually increase to 4 hours or more a week. • Sessions should be at least 10 minutes at a time. 	<p>Brisk walking Biking Raking leaves Continuous swimming Dancing Water aerobics</p>
<p>Resistance – all persons with diabetes, including elderly.</p>	<ul style="list-style-type: none"> • 3 times a week. • Start with 1 set of 10-15 repetitions. • Progress to 2 sets of 10-15. • Then 3 sets of 8. 	<p>Weight lifting. Exercise with weight machines.</p>

Waist Circumference

- Waistline affects health
- Maintain/reduce weight
 - M: < 40 inches/102 cm
 - W: < 35 inches/88 cm
 - 5-10% weight loss

There are some variations in target based on cultural background. Check out the Heart and Stroke for more information.



What do I eat?



Nutrition Therapy can reduce A1c by 1-2%:

- **Eat Healthy Foods:**
 - Higher in Fibre
 - Less processed
 - ++ vegetables
- **Spread food intake out over the day**
- **Manage portions (carbohydrate)**



Variety of Eating Patterns work**:

- **Mediterranean/Nordic Style**
- **Vegetarian**
- **DASH & Low Sodium**
- **Portfolio Diet**
- **Low Carbohydrate Interventions (<130 gm/day)***



* Recommended to have RD support to implement

**You may still need to take medication

A REVIEW OF THE NUTRIENTS

Carbohydrate	Protein	Fat
Turns to sugar in the blood	Little effect on blood sugar	Little effect on blood sugar
<u>Sources:</u> Breads Cereals Sugars Fruit Juices Milk	<u>Sources:</u> Meat Fish Poultry Cheese Eggs Beans and lentils	<u>Sources:</u> Margarine/Butter Oils Nuts Salad dressings Cream Gravy

Digestion Times:

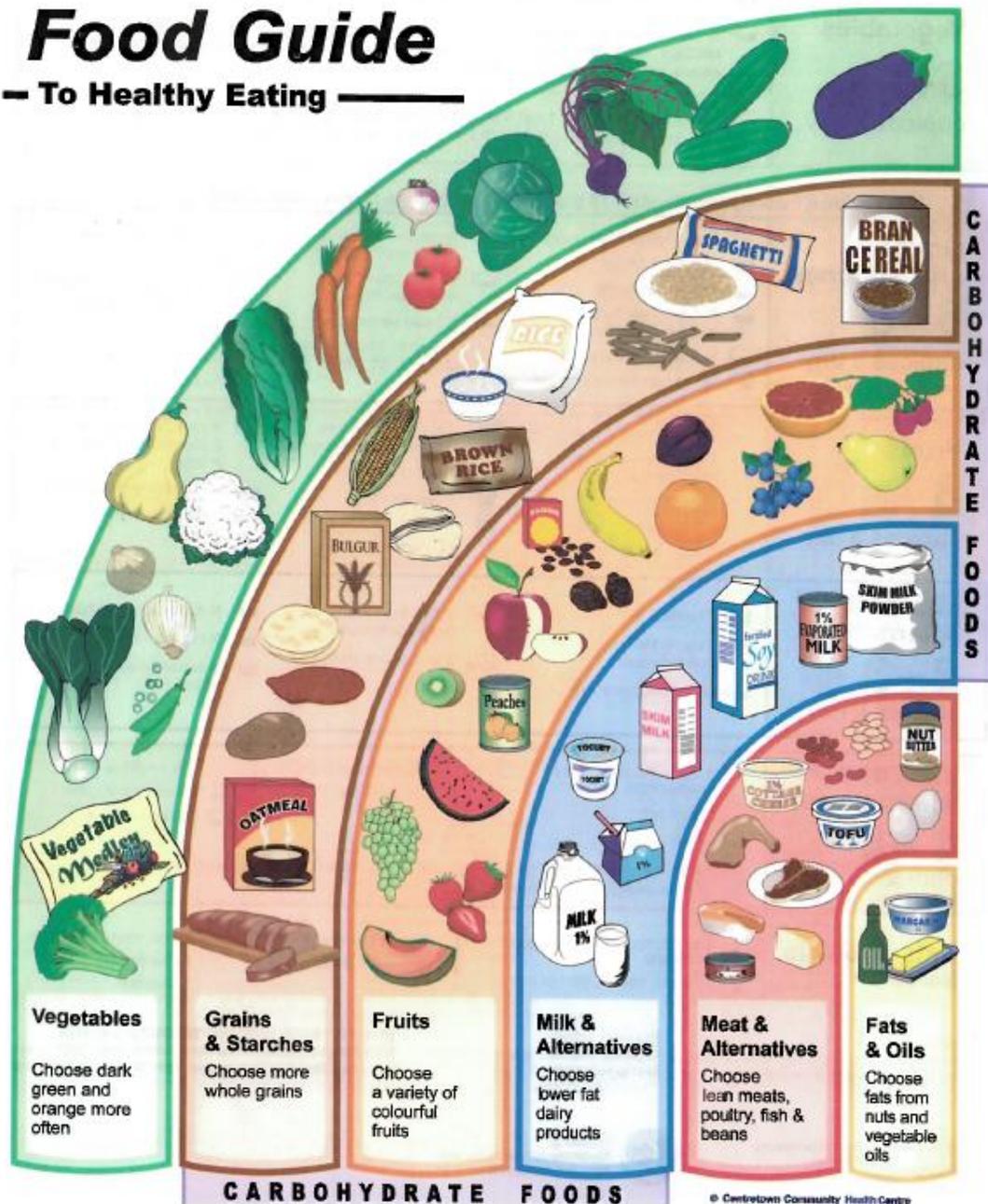
Carbohydrates → 1 - 60 mins

Protein → 1 – 2 hours

Fat → 3 – 4 hours

Therefore try to have a small portion of protein with each meal

— The —
Diabetes
Food Guide
 — To Healthy Eating —



The Diabetes Food Guide

Recommended Daily Food Choices	What is a choice?																								
Vegetables 5+ choices a day	<ul style="list-style-type: none">  1 cup raw leafy greens, or  ½ cup cooked (spinach, romaine, kale, endive, swiss chard)  ½ cup raw/cooked: asparagus, beets, broccoli, green and yellow string beans, carrots, cabbage, cauliflower, celery, cucumber, eggplant, leeks, mushrooms, mixed frozen vegetables, onions, green and red peppers, tomato, turnips, zucchini <p><i>* portions of more than 1 cup of parsnips, peas, winter squash and tomato sauce will add 15 g of available carbohydrate (3 teaspoons of sugar) to your meal.</i></p>																								
1 choice from carbohydrate foods = 15 grams of carbohydrate (3 teaspoons of sugar)																									
C A R B O H Y D R A T E F O O D S	Grains and Starches 6–8 choices a day <i>Measure after cooking</i>	<table border="0" style="width: 100%;"> <tr> <td> 1 slice whole grain bread</td> <td> ½ medium potato or ½ cup mashed potato</td> <td> ½ (6 inch) pita bread</td> </tr> <tr> <td> ¾ cup hot cereal</td> <td> 1/3 cup brown rice, white rice, millet</td> <td> ¼ large bagel</td> </tr> <tr> <td> ½ cup cold cereal</td> <td> 1/3 cup sweet potato</td> <td> 1 (4 inch) pancake or waffle</td> </tr> <tr> <td> ½ cup barley, bulgur, buckwheat, quinoa, wild rice</td> <td> 1 (6 inch) whole wheat chapatti, roti, tortilla</td> <td> 1 (2 inch) small muffin</td> </tr> <tr> <td> ½ cup pasta, couscous</td> <td></td> <td> 3 cups popcorn</td> </tr> <tr> <td> ½ cup corn kernel or ½ cob</td> <td></td> <td> ½ english muffin</td> </tr> <tr> <td></td> <td></td> <td> 7 soda crackers</td> </tr> </table>			 1 slice whole grain bread	 ½ medium potato or ½ cup mashed potato	 ½ (6 inch) pita bread	 ¾ cup hot cereal	 1/3 cup brown rice, white rice, millet	 ¼ large bagel	 ½ cup cold cereal	 1/3 cup sweet potato	 1 (4 inch) pancake or waffle	 ½ cup barley, bulgur, buckwheat, quinoa, wild rice	 1 (6 inch) whole wheat chapatti, roti, tortilla	 1 (2 inch) small muffin	 ½ cup pasta, couscous		 3 cups popcorn	 ½ cup corn kernel or ½ cob		 ½ english muffin			 7 soda crackers
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Fruits 3 choices a day	<table border="0" style="width: 100%;"> <tr> <td> 1 medium: apple, orange, pear</td> <td> 2 cups strawberries, blackberries, raspberries</td> <td> ½ cup unsweetened applesauce, canned fruit in juice</td> </tr> <tr> <td> 2 medium: kiwi, plums, clementine oranges</td> <td> 1 cup blueberries</td> <td> ½ cup unsweetened juice</td> </tr> <tr> <td> ½ medium mango</td> <td> 1 cup melon</td> <td> ¼ cup mixed dried fruit</td> </tr> <tr> <td> 1 small banana, grapefruit</td> <td> ¾ cup fresh pineapple</td> <td></td> </tr> <tr> <td> 1 large peach, nectarine</td> <td> 15 grapes, cherries</td> <td></td> </tr> </table>			 1 medium: apple, orange, pear	 2 cups strawberries, blackberries, raspberries	 ½ cup unsweetened applesauce, canned fruit in juice	 2 medium: kiwi, plums, clementine oranges	 1 cup blueberries	 ½ cup unsweetened juice	 ½ medium mango	 1 cup melon	 ¼ cup mixed dried fruit	 1 small banana, grapefruit	 ¾ cup fresh pineapple		 1 large peach, nectarine	 15 grapes, cherries								
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Milk and Alternatives 2–3 choices a day	<table border="0" style="width: 100%;"> <tr> <td> 1 cup milk</td> <td> ½ cup fortified soy beverage flavoured</td> <td> ½ cup evaporated milk</td> </tr> <tr> <td> 1 cup fortified soy beverage plain</td> <td> 4 tbsp powdered milk</td> <td> ¾ cup plain low fat yogurt</td> </tr> <tr> <td> ½ cup chocolate milk</td> <td></td> <td> ¾ cup artificially sweetened yogurt</td> </tr> </table>			 1 cup milk	 ½ cup fortified soy beverage flavoured	 ½ cup evaporated milk	 1 cup fortified soy beverage plain	 4 tbsp powdered milk	 ¾ cup plain low fat yogurt	 ½ cup chocolate milk		 ¾ cup artificially sweetened yogurt													
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Meat and Alternatives 4–8 choices a day <i>Measure after cooking</i>	<table border="0" style="width: 100%;"> <tr> <td> 1 ounce (30 g) lean meat, poultry or fish</td> <td> ¼ cup cottage cheese (1-2% MF)</td> <td> ½ block (85 g) tofu</td> </tr> <tr> <td> 1 large egg</td> <td> 1 ounce (30 g) cheese (<20% MF)</td> <td> 2 tbsp. peanut butter</td> </tr> <tr> <td> ¼ cup canned fish</td> <td> ½ cup legumes (beans, peas, lentils)*</td> <td> 1/3 cup hummus</td> </tr> </table> <p><i>* portions of more than 1 cup of beans and lentils will add 15 g of available carbohydrate (3 teaspoons of sugar) to your meal.</i></p>			 1 ounce (30 g) lean meat, poultry or fish	 ¼ cup cottage cheese (1-2% MF)	 ½ block (85 g) tofu	 1 large egg	 1 ounce (30 g) cheese (<20% MF)	 2 tbsp. peanut butter	 ¼ cup canned fish	 ½ cup legumes (beans, peas, lentils)*	 1/3 cup hummus													
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Fats and Oils Moderation	<table border="0" style="width: 100%;"> <tr> <td> 1 tsp. butter or non hydrogenated margarine</td> <td> 1 tbsp. nuts or seeds</td> <td> 1 tbsp. mayonnaise, light</td> </tr> <tr> <td> 1 tsp. oil, canola, olive or peanut</td> <td> 1 tbsp. salad dressing, regular</td> <td> 1 slice bacon</td> </tr> <tr> <td></td> <td></td> <td> ¼ avocado</td> </tr> </table>			 1 tsp. butter or non hydrogenated margarine	 1 tbsp. nuts or seeds	 1 tbsp. mayonnaise, light	 1 tsp. oil, canola, olive or peanut	 1 tbsp. salad dressing, regular	 1 slice bacon			 ¼ avocado													
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Carbohydrate Containing Foods: each portion listed contains ~15 gm carbohydrate- *use labels to confirm how much Carbohydrate is in a portion
 (Except gray shaded foods: most vegetables/meat/cheese have very little carbohydrate, they are mostly protein/fat)

Grains/Starches	Fruit	Dairy & Alt	Meat & Alt ~7gm protein/serving below
<ul style="list-style-type: none"> • 1 slice bread • ½ bagel • 1 pkg oatmeal, plain • ½ pkg oatmeal, sweetened • ½ hamburger/hotdog bun • 1 med pancake • 1 toaster waffle • 1/12 slice of 12" pizza • 1 small potato, ½ med potato • 1/3 sweet potato • ½ c. corn • ½ c pasta, rice, couscous • ¾ c hot cereal • 30 gm* (¼ - 1 c) cold cereals • ½ pita • 1 small wrap • ½ large wrap • 30 gm *crackers (7 saltines, 4 melba toasts, 5 triscuits, etc) • 1 c. soups that have grains in them: barley, pea soup, lentils, noodles • 10 french fries • 3 c. popcorn 	<ul style="list-style-type: none"> • ½ c most fruit chopped/canned • 1 small whole fruit • ½ c. juice • 1- 1 ½ c. berries • ¼ c. dried fruit (apricots, raisins, dates, etc) • ½ banana • 1 c. melon <p>Other Examples ~15 gm Carb/serving:</p> <ul style="list-style-type: none"> • 10 chips • 30 pretzel sticks • 1 bar (28 g) granola bar • 4 arrowroots • 2 chocolate chip cookies • 1 mini muffin • 1 tbsp molasses • 10 chocolate covered almonds • 1 tbsp jam/sugar/honey 	<ul style="list-style-type: none"> • 1 c. milk (skim/1%) • ¾ c. yogurt, • 200 ml drinkable yogurts • ½ c. pudding • ½ c ice cream • 1 (50 gm) ice cream bar <ul style="list-style-type: none"> • ½ c. cottage cheese • 1 cheese string (* no sugar in cheese) • 1"x1"x2" cheese <hr/> <p style="text-align: center;"><u>Vegetables</u></p> <ul style="list-style-type: none"> • ½ c. any vegetable (except leafy greens) • 1 c. leafy greens/salad 	<ul style="list-style-type: none"> • 1 oz cooked meat (size of finger or golf ball) (2.5 oz= size of deck of cards) • 2 tbsp Peanut Butter • 2 egg whites • 1 egg • ½ tin salmon/tuna • ½ c. beans/lentils • ¼ c. nuts • 1/3 c. hummus • 2 slices prepared deli meats* • ¼ can sardines • protein powder (depends on brand/scoop, every 7 gm protein=1 serving) <p style="text-align: center;">*all the 'gray' highlighted foods do not contain any sugar/carbohydrates</p> <p style="text-align: center;">*avoid deli meats as much as possible due to additives</p>

*Use label on product/cereal to know what serving size the information relates to:

Nutrition Facts

Per 125 mL (87 g)*

Amount	% Daily Value**		
Calories 80			
Fat 0.5 g		1 %	
Saturated 0 g + Trans 0 g		0 %	
Cholesterol 0 mg			
Sodium 0 mg		0 %	
Carbohydrate 18 g		6 %	
Fibre 2 g		8 %	
Sugars 2 g			
Protein 3 g			
Vitamin A	2 %	Vitamin C	10 %
Calcium	0 %	Iron	2 %

How to Carb Budget?

- Establish a “Budget” for each meal/ snack
- **Tip to help:** (?age/?activity/?size)
 - Female: <3 carb portions/meal (1 carb/snack)
 - Male: <4 carb portions/meal (1-2 carb/snack)
- **Judge** carb portion to: post-meal glucose (1-2 hr)
- **Adjust** carbs as needed

Avoid Refined Carbohydrates

- Low fibre/"white"/processed carbs cause fast rise in blood sugar
 - i.e.- juice vs. fruit or white vs. whole wheat bread, chips/crackers vs popcorn
 - Result: rush of sugar into blood, sugar can go too high, +insulin that increases fat storage in body
 - Feel hungry sooner



FIBRE BENEFITS

- Fibre is part of the carbohydrate that causes a slower release of sugar
 - Gradual rise in blood sugar
 - Doesn't go as high

Choose:

- Vegetables/Fruit
- Beans/Lentils/Whole foods
- Whole Grain bread
- Cereals: > 4g fibre/serving
<8g sugar/serving



Glycemic Index

There are 3 categories of foods:



<number>

Grains and Starches

**Low Glycemic Index
(55 or less)
Choose Most Often**

Breads:

Heavy Mixed Grain Breads
Spelt Bread
Sourdough Bread
Tortilla (Whole Grain)

Cereal:

All-Bran™ Cereal
All-Bran Buds™
With Psyllium Cereal
Oat Bran
Oats (Steel Cut)

Grains:

Barley
Bulgur
Mung Bean Noodles
Pasta (Al Dente, Firm)
Pulse Flours
Quinoa
Rice (Converted, Parboiled)

Other:

Peas
Popcorn
Sweet Potato
Winter Squash

**Medium Glycemic Index
(56 to 69)
Choose Less Often**

Breads:

Chapati (White, Whole Wheat)
Flaxseed/Linseed Bread
Pita Bread (White, Whole Wheat)
Pumpernickel Bread
Roti (White, Whole Wheat)
Rye Bread
(Light, Dark, Whole Grain)
Stone Ground Whole
Wheat Bread
Whole Grain Wheat Bread

Cereal:

Cream of Wheat™ (Regular)
Oats (Instant)
Oats (Large Flake)
Oats (Quick)

Grains:

Basmati Rice
Brown Rice
Cornmeal
Couscous
(Regular, Whole Wheat)
Rice Noodles
White Rice (Short, Long Grain)
Wild Rice

**High Glycemic Index
(70 or more)
Choose Least Often**

Breads:

Bread (White, Whole Wheat)
Naan (White, Whole Wheat)

Cereal:

All-Bran Flakes™ Cereal
Corn Flakes™ Cereal
Cream of Wheat™ (Instant)
Puffed Wheat Cereal
Rice Krispies™ Cereal
Special K™ Cereal

Grains:

Jasmine Rice
Millet
Sticky Rice
White Rice (Instant)

Other:

Carrots*
Potato (Instant Mashed)
Potato (Red, White, Hot)
Pretzels
Rice Cakes
Soda Crackers

What about “natural sugar”?

- Natural sugar still raises blood sugar.
- Juice contains natural sugar from the fruit.
- “No added sugar” DOES NOT mean sugar-free (there may still be natural sugar in the food product)



Meal Spacing

- Three meals per day 4-6 hours apart
- Slow down
- Cleaning your plate is optional
- You may benefit from a healthy snack, especially in the evening (but only if it improves your morning fasting BG level)



Reason?

Helps your body control blood glucose levels.

Spread the carbohydrate foods out

A Balanced Meal

- Use your plate as a guide...

Also remember to:

- Enjoy your food
- Eat a variety of foods
- Eat with others at a table if possible
- Cook meals at home
- Be mindful of your habits

Have plenty of
vegetables and fruits

Eat protein foods

Make water
your drink
of choice

Choose
whole grain
foods

Summary of Tips

- 3 meals/day, 4-6 hrs apart
- Limit sugars/sweets (goal <6-10 tsp sugar/day (1 can pop/glass juice =10 tsp)
- Reduce processed foods
- Eat more healthy fats (nuts, seeds, fish, avocados, olives etc)
- Eat more fibre
- If you are thirsty, drink water
- Increase activity, as able
- Limit alcohol

Have plenty of
vegetables and fruits

Eat protein foods

Make water
your drink
of choice



Choose
whole grain
foods

Where do we go from here?



**WHAT'S
NEXT?**

YOU ARE WELCOME TO BOOK AN
INDIVIDUAL FOLLOW-UP
APPOINTMENT WITH A DIETITIAN
OR NURSE

Family Health Team
Contact Information
519-843-3947 Admin Ext
126

BEFORE YOU GO!

Please take our feedback poll!

And don't forget to follow us on social media to know what courses are coming up!



Take our full patient survey!
<https://uppergrandfht.org/survey/>



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