

# Diabetes/Pre-Diabetes Prevention and Management Week 1

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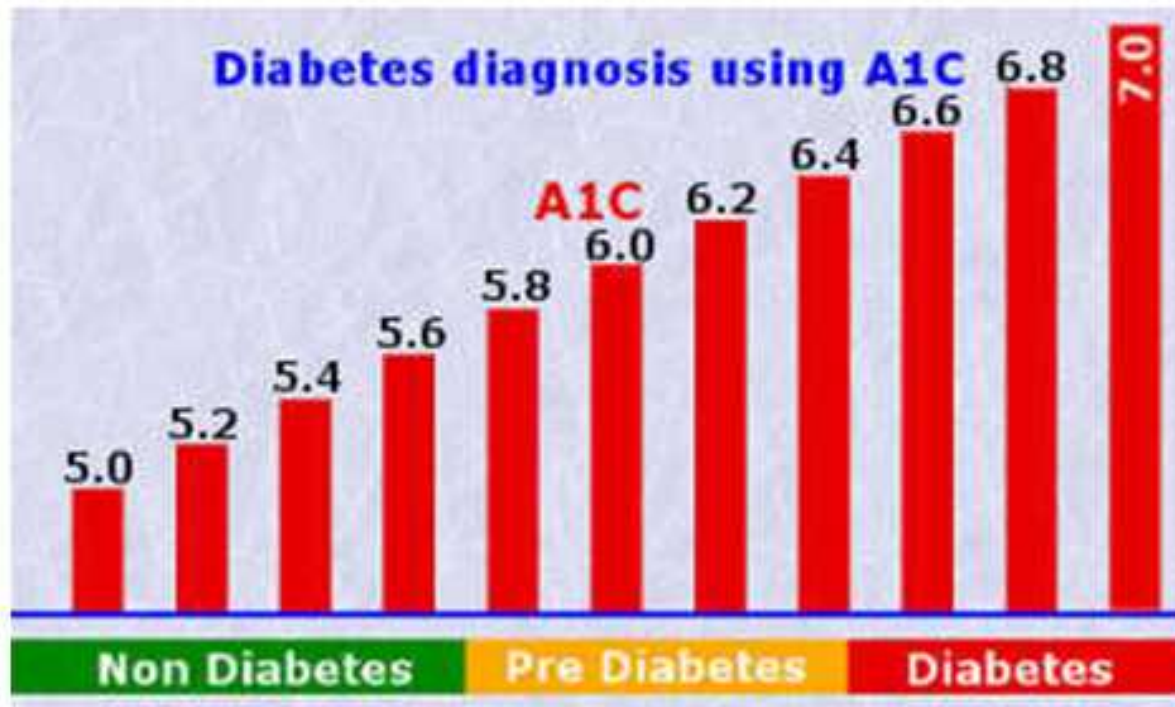
# Diagnosing Diabetes

- 3 different blood tests can be used to diagnose diabetes
- A1c
- FBG – Fasting Blood Glucose
- OGTT-Oral Glucose Tolerance Test



Pre-Diabetes: 5.7% to 6.4%

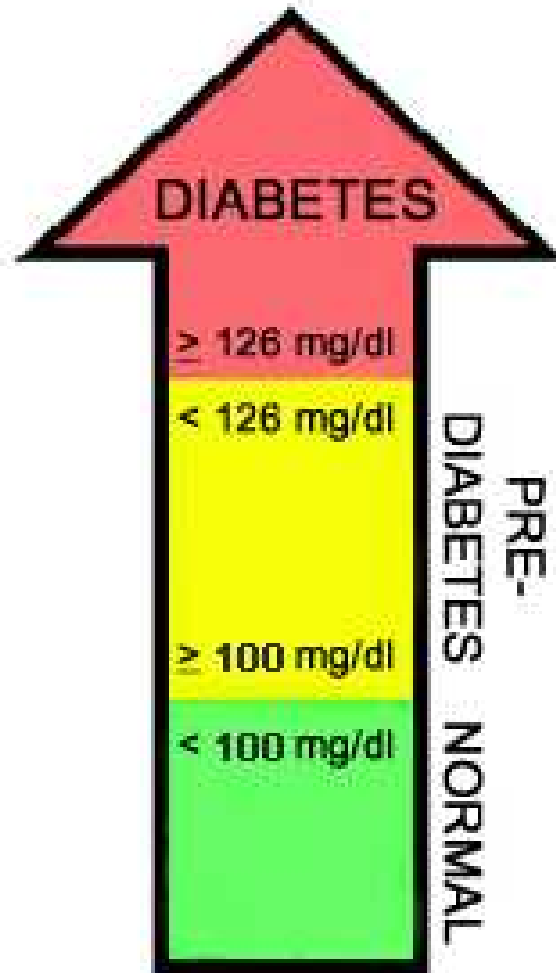
Diabetes: 6.5% or higher



# Fasting Blood Glucose

Pre-Diabetes:  $\geq$  or = 100-125

Diabetes: 126 or greater, two separate tests



# Post Meal Tolerance Test

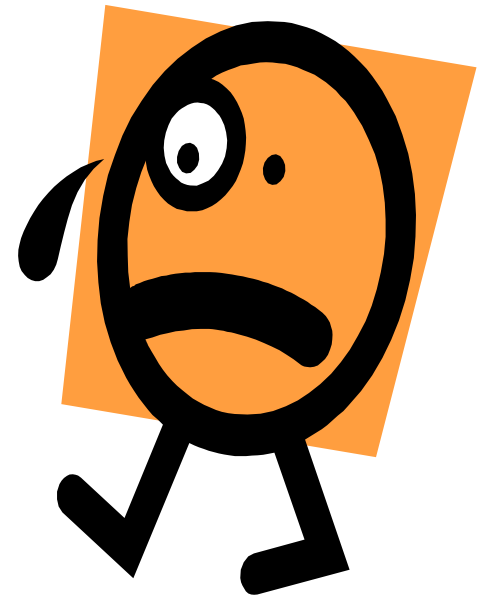
2 Hours after a large meal or GTT Beverage

- Pre-Diabetes:
- Blood glucose between 140-199
  
- Diabetes:
- Blood glucose 200 or greater



# Diabetes is

- Too much sugar in the blood
- The body has trouble processing sugar correctly

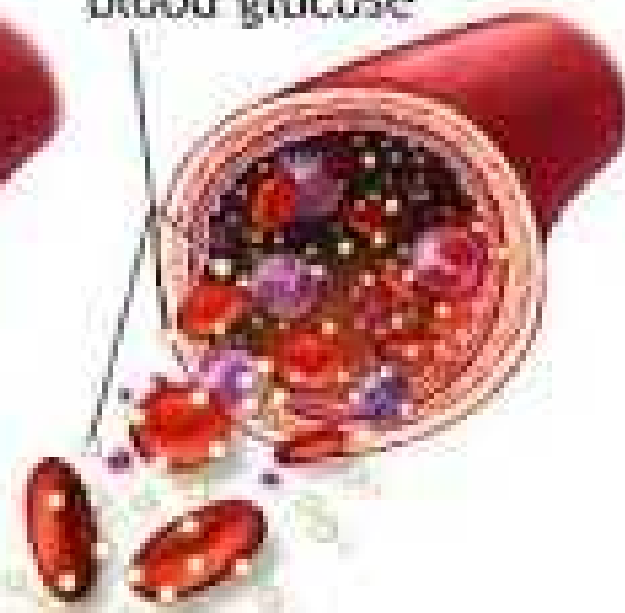


Your goal is to maintain normal blood glucose levels

Glucose  
in blood



Excessive  
blood glucose



# Definition of Diabetes

- The insulin the body makes does not work – insulin resistance.
- This makes the pancreas work overtime to try to make enough insulin to keep the sugar normal.
- Over time, the pancreas can't make enough insulin to keep blood sugars at normal levels, **AND**
- The liver makes too much sugar.

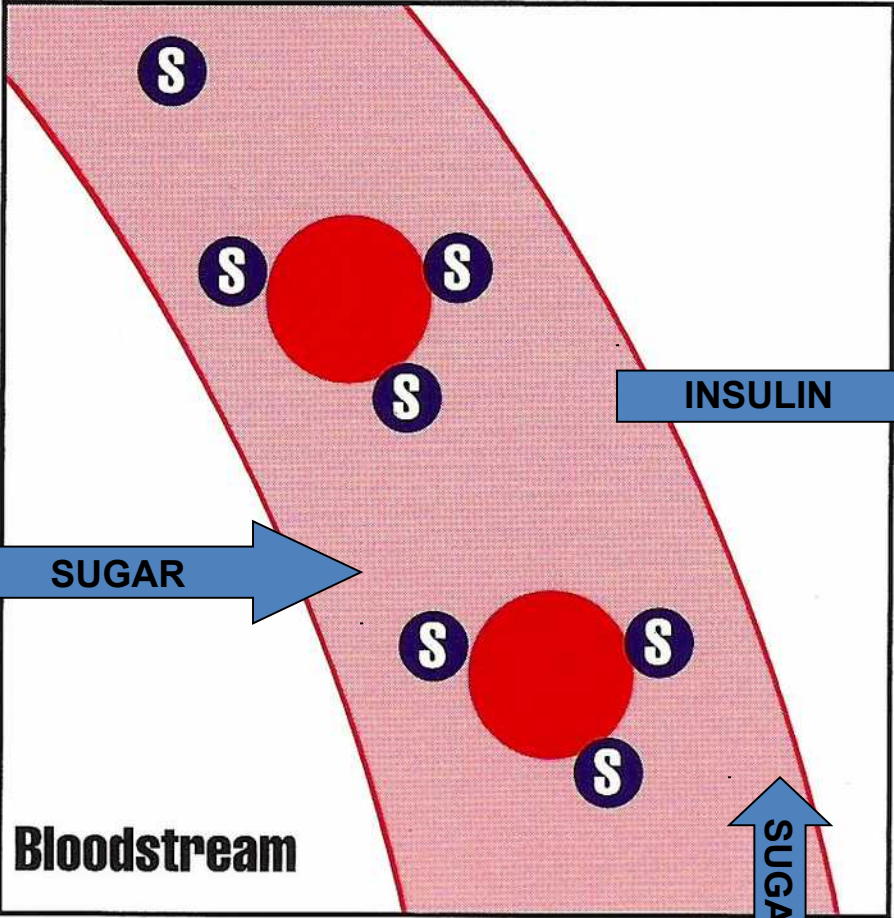
# Normal Blood Sugar

PANCREAS

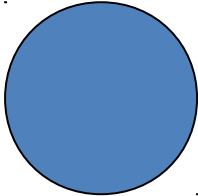


INSULIN

**Normal**



MUSCLE AND FAT



INSULIN



SUGAR



**Bloodstream**

SUGAR



**LIVER**

CARBS  
starches  
fruit & juice  
milk & yogurt  
sweets

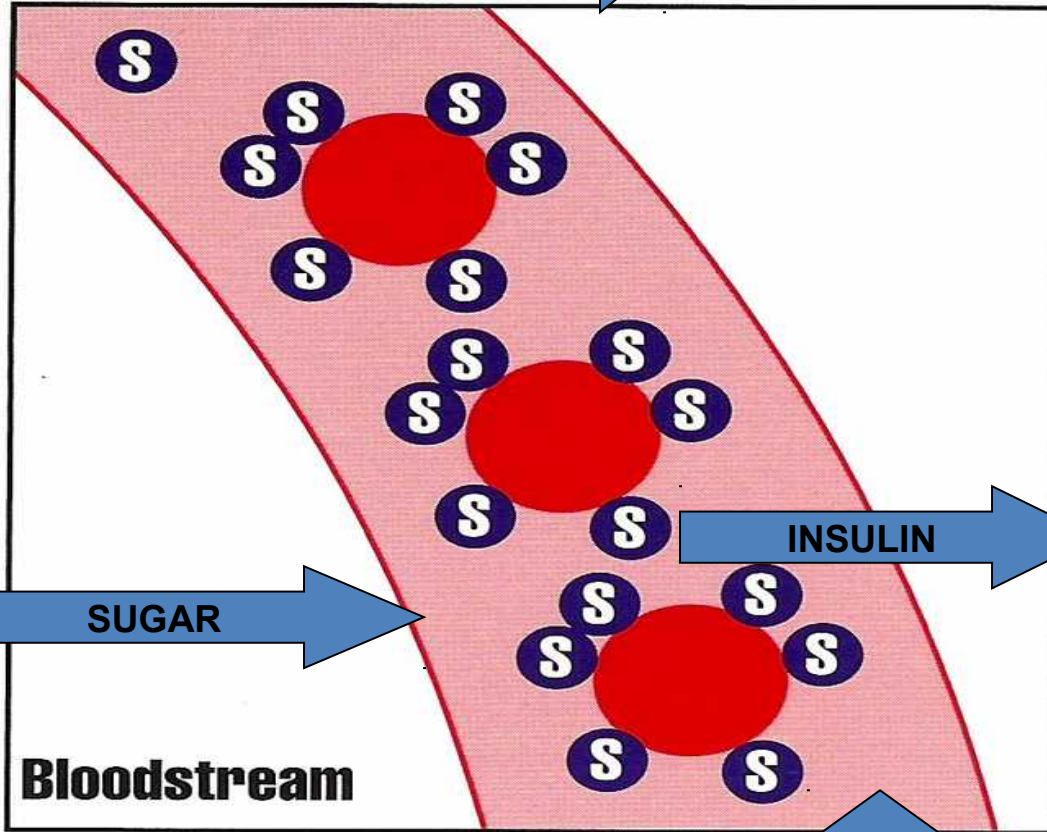
# High Blood Sugar

PANCREAS

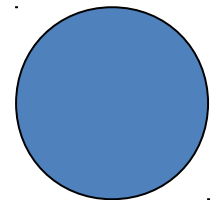


INSULIN

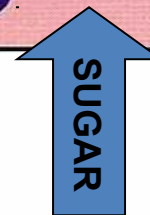
**High**



MUSCLE  
AND  
FAT

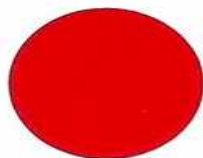


CARBS  
starches  
fruit & juice  
milk & yogurt  
sweets



LIVER

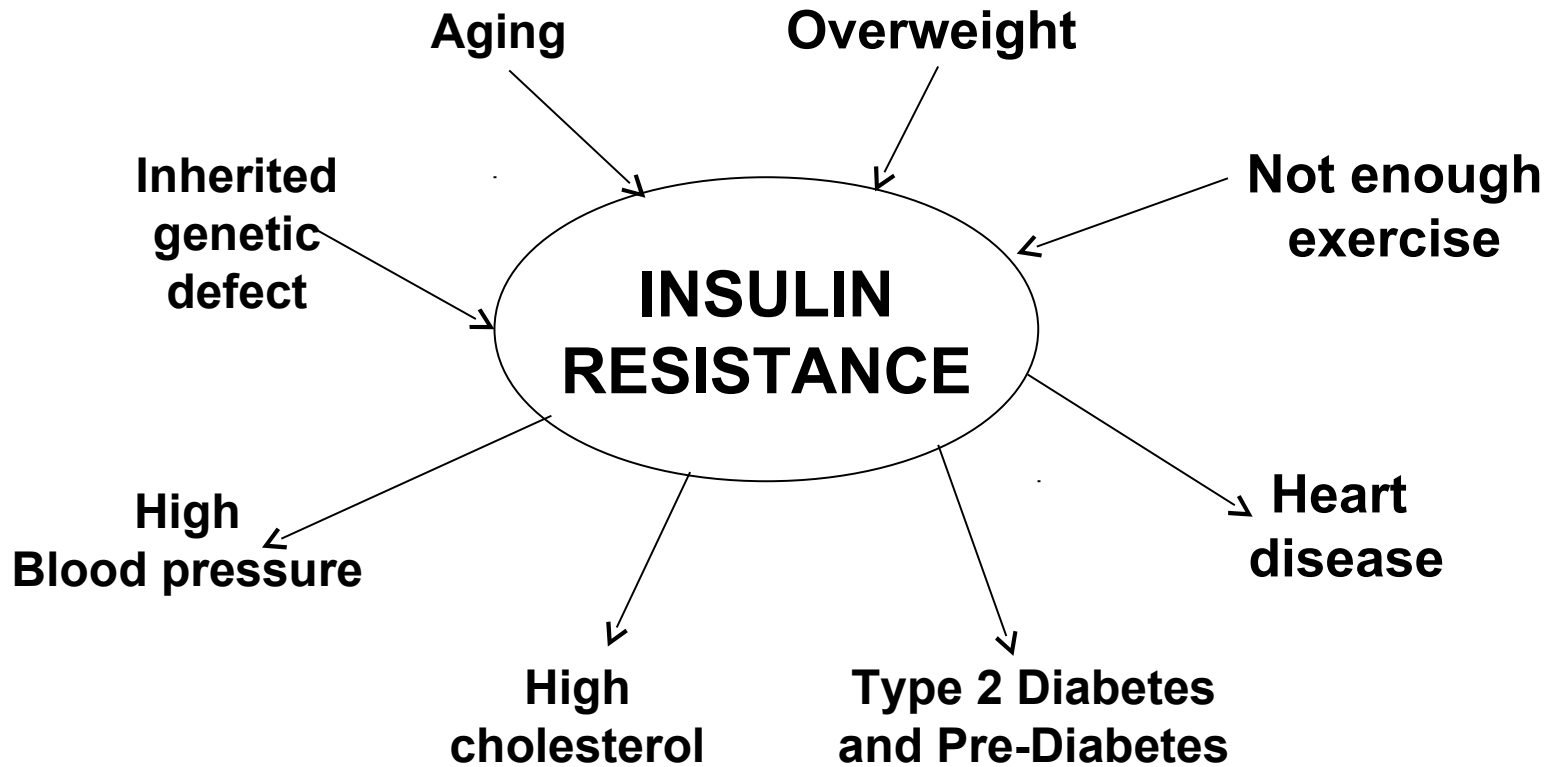
**S** Sugar



Red Blood Cell



# Insulin Resistance



# What Can You Do About Insulin Resistance?

- ***Exercise***



- ***Lose weight***



# Diabetes

## Type 1

- Occurs most often in children and young adults
- The pancreas makes no insulin
- Insulin injections are necessary to live

## Type 2

- Usually begins in adulthood, younger if overweight
- The pancreas does not make enough insulin; insulin doesn't work well
- Treated with diet, exercise, pills, and/or insulin

# Other Types of Diabetes

- Gestational diabetes: high blood sugar during pregnancy
- Pre-diabetes: blood sugar that falls between “normal” and “diabetic” levels

Gestational or pre-diabetes: increased risk of developing type 2 diabetes in the future

# Diabetes Risk Factors

- Overweight (central obesity) – insulin resistance
- Advancing age
- Race
- Lack of physical activity or exercise
- Family history (parent or sibling)
- Pre-Diabetes
- Gestational Diabetes/women who delivered baby over 9 lbs.
- High blood pressure
- HDL <35 and/or triglycerides > 250
- Women with PCOS – Polycystic Ovarian Syndrome
- History of heart disease
- Acanthosis nigricans



# Diabetes Symptoms

- Type 1 (symptoms usually occur suddenly)
  - frequent urination
  - excessive thirst
  - extreme hunger
  - dramatic weight loss
  - irritability
  - weakness and fatigue
  - nausea and vomiting
- Type 2 (symptoms usually occur gradually)
  - any of the type 1 symptoms
  - recurring or hard-to-heal skin, gum or bladder infections
  - drowsiness
  - blurred vision
  - tingling/numbness in hands/feet
  - itching

# DIABETES

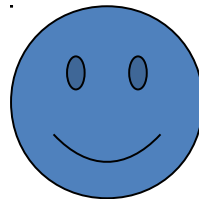
KNOW THE SYMPTOMS

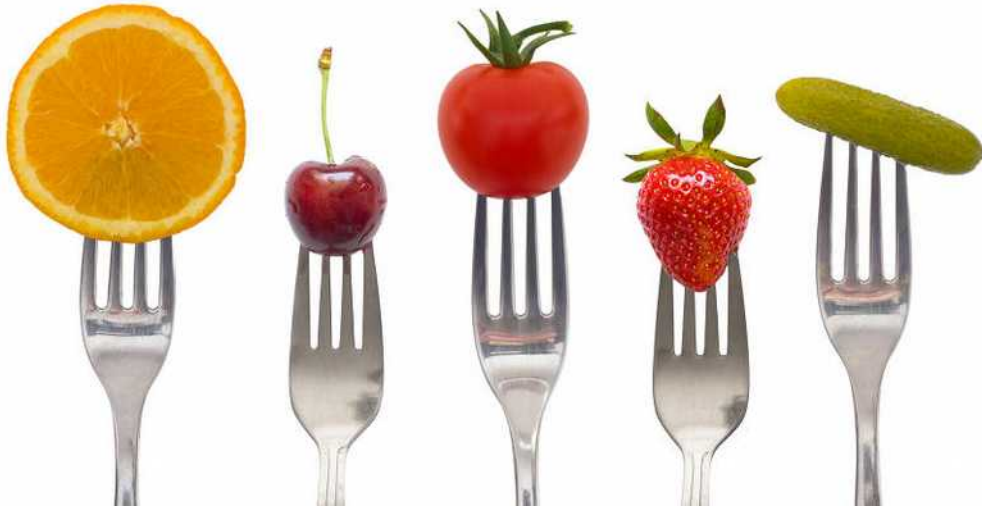




# Diabetes is Treated By:

- **Healthy eating** – spread carbs out throughout the day so you don't overwork your pancreas
- **Weight loss** – to help your insulin work better
- **Exercise** – so your body will need less insulin and your insulin will work better
- **Medicine** – Your body's own insulin is also your medicine. Other diabetes medicines may also be needed





# Hemoglobin A1c

- Is another tool for keeping track of diabetes
- Three month average of what your blood sugars have been running

Problem:

- Doesn't tell us where there are highs and lows

<b>A1C %</b>	<b>eAG mg/dl</b>
12.0	298
11.5	283
11.0	269
10.5	255
10.0	240
9.5	226
9.0	212
8.5	197
8.0	183
7.5	169
7.0	154
6.5	140
6.0	126
5.5	111
5.0	97

# When to Check Blood Sugars

Typically

- If not on insulin, once or twice daily – alternating before and 2 hours after meals
- If on insulin, at least 3 times daily – before each meal and/or bedtime
- Pre-Diabetes: 2 to 3 times a week or daily if able. Alternate times when you check.

# Target Blood Sugars for Diabetes\*

	ADA	AACE
Before Meals	80 to 130 mg/dl	< 110 mg/dl
2 Hours After Meals	< 180 mg/dl	< 140 mg/dl
A1C	< 7.0%	<6.5%

ADA = American Diabetes Association

AACE = American Association of Clinical Endocrinologists

\*Your doctor may adjust these for you.

# Target Blood Sugars for Pre-Diabetes

- Lower your A1C
- Don't let blood sugar numbers get higher
- Even better: get A1C and blood sugar numbers in the normal range



# Stand Up and Move Every 30 Minutes!





# Acute Complications

Hypoglycemia

(low blood sugar)



Hyperglycemia

(high blood sugar)



# Hypoglycemia

## Low Blood Sugar

Blood sugar level drops below 70

Symptoms include:

hunger

nervousness and shakiness

sweating

light-headedness

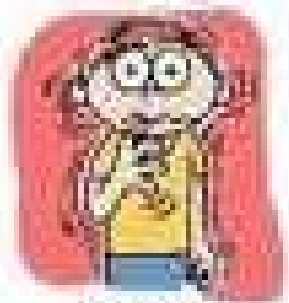
sleepiness

confusion

anxiety



## Low Blood Sugar Symptoms



SHAKING



SWEATING



ANXIOUS



DIZZINESS



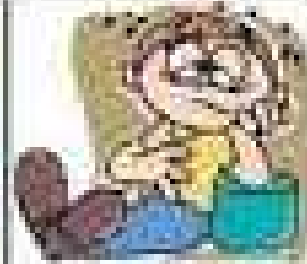
HUNGER



FAST HEARDBEAT



IMPAIRED VISION



WEARINESS  
FATIGUE



HEADACHE



IRRITABLE

# Low Blood Sugar

## Causes

- Not enough food
- Skipped or delayed meal
- Too much insulin or diabetes medicine
- Extra activity

## Onset

- Sudden
- May progress to insulin shock

# Low Blood Sugar

- If blood sugar is too low:
  1. check blood sugar - if blood sugar is 70 or less, eat or drink a fast-acting sugar
  2. if you don't have your meter and have symptoms, assume it is low and treat with:
    - 3 – 5 glucose tablets or gel or liquid
    - ½ cup fruit juice
    - ½ cup regular soda
    - 1 cup low-fat milk
    - 5 to 7 pieces of soft candy (peppermint)\*
    - 1 tablespoon of sugar or honey

**\*Do not treat lows with chocolate or peanut butter crackers**

# Low Blood Sugar

3. Wait 15 minutes. Recheck blood sugar

If still below 70, eat/drink sugar again

If your next meal is more than 1 hour away, eat a snack

Let your doctor know if you have frequent low blood sugars:

Change meal plan

Change exercise

Change diabetes meds







# Low Blood Sugar

- Always wear medical ID.
- Carry some form of sugar with you at all times.



"I'm the Blood Sugar Fairy.  
If you can see me, yours is too low."

# Hyperglycemia

## High Blood Sugar

### Caused by

- too much food
- meals or snacks too close together
- too little insulin or diabetes medicine
- illness or stress

### Onset

- gradual
- may progress to diabetic coma

# High Blood Sugar

- Symptoms include:
  - extreme thirst
  - frequent urination
  - dry, itchy skin
  - hunger
  - blurred vision
  - drowsiness
  - decreased healing

# High Blood Sugar

- test your blood sugar
- drink extra water
- if over 130 before meals or over 180 two hours after meals
- ask your doctor about checking for ketones

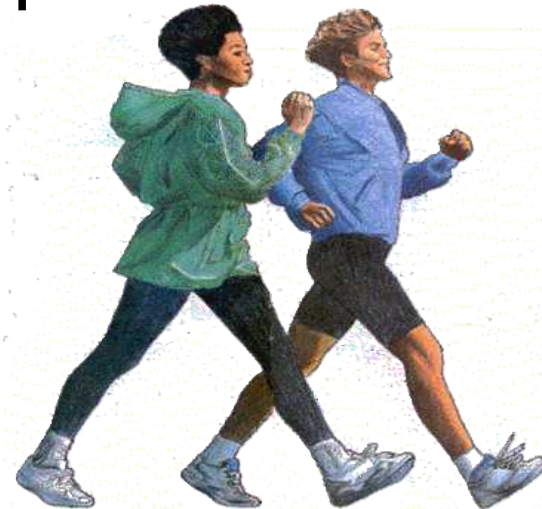


**Call Your Doctor**



# Getting Started

- Choose healthy foods
- Be active
- Eat out less often



# Choose Healthy Carbs

## Eat Daily:

- 2-4 servings fruit (fruit, not juice)
- 3-5 servings low-carb vegetables
- 3 whole grains (oats, quinoa, barley, popcorn, whole wheat bread/crackers)
- 3 low-fat dairy foods
- Starchy beans and peas (pinto, black, butter beans, black-eyed peas). Try bean pastas. May lower blood sugars.



# Low-Carb Vegetables

- Slow carbs
- Fill you up
- Contain fiber
- Low calories





# Low-Carb Vegetables

Asparagus

Green Beans

Beets

Broccoli

Brussel Sprouts

Carrots

Cauliflower

Greens (collards, kale)

Lettuce/greens

Mushrooms

Okra and Onions

Bell Peppers

Spinach

Tomatoes

Turnips

Zucchini & yellow squash

# What's One Thing you can do to be healthier?

- I will eat 2 servings of low-carb vegetables a day
- I will walk for 20 minutes 3 times a week (check with your doctor first)
- Write it down:
- Bring to class next week: this sheet, one food label