Diabetes 101

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Disclosures:

I have nothing to disclose



Objectives

- To review the incidence of diabetes and obesity
- To explain the differences amongst Type 1 Diabetes, Type 2 Diabetes, and Gestational Diabetes
- To review the potential complications of diabetes
- To review dietary recommendations for controlling metabolic disorders
- To review the current recommendations for daily physical activity
- To demonstrate glucometer use and to give attendees an opportunity to check their own blood sugar
- To demonstrate insulin pens and to explain newer diabetes technology, like insulin pumps



What is an endocrinologist?

Endocrinologists are internal medicine physicians who complete additional specialty training in order to diagnose and treat diseases related to the glands, hormones, and metabolism. The diseases they are trained to treat often affect other parts of the body and its overall function.



What does an endocrinologist treat?

- Diabetes
- Obesity
- Osteoporosis
- Adrenal gland disorders
- Pituitary problems
- Menopause
- Thyroid diseases

- Infertility
- Sexual Function
- Low testosterone
- Transgender medicine
- Cholesterol disorders
- Hypertension
- Cancers of the endocrine glands



Always Remember the Basics EAT DRINK MOVE **SLEEP**

HEALTHILY



What Happens When We Eat?



After eating, most food is turned into glucose, the body's main source of energy.





Normal Blood Glucose Control

In people without diabetes, glucose stays in a healthy range because

Insulin is released at the right times and in the right amounts



Insulin helps glucose enter cells High Blood Glucose (Hyperglycemia) In diabetes, blood glucose builds up for several possible reasons...



Symptoms of Hyperglycemia



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- Increased thirst
- Increased urination
- •Blurry vision
- •Feeling tired
- •Slow healing of cuts or wounds
- More frequent infections
- •Weight loss
- Nausea and vomiting

Hyperglycemia Can Cause Serious Long-Term Problems

Chronic complications of diabetes

- Blindness
- Kidney disease
- Nerve damage
- Amputation
- Heart attack
- Stroke





T2DM Is a Chronic, Lifelong Condition That Can Damage Our Bodies Dramatically

Hyperglycemia is a major and independent risk factor for both microvascular and macrovascular complications of diabetes

Macrovascular Complications



The risk of stroke in newly treated type 2 diabetes is more than double that of the general population¹



People with diabetes are two to four times more likely to have cardiovascular disease than someone without diabetes² **Microvascular Complications**

Damage to the kidney filtering systems from diabetes (diabetic nephropathy) is a leading cause of kidney failure³

Microvascular damage to the retina from diabetes (diabetic retinopathy) is a leading cause of blindness⁴

Damage to the nerves from diabetes (diabetic neuropathy) is a leading cause of foot wounds and ulcers, which frequently leads to foot and leg amputation⁵

1. Jeerakathil T, et al. *Stroke*. 2007;38(6):1739-1743; 2. World Heart Federation. Cardiovascular Risk Factors – Diabetes. www.worldheart.org/cardiovascular-health/cardiovascular-disease-risk-factors/diabetes/. Accessed May 2010; 3. Hovind P, et al. *Kidney Int*. 2001; 59(2):702-709; 4. Fong DS, et al. *Diabetes Care*. 2004;27(10):2540-2553; 5. Dang CN, et al. *Int J Low Extrem Wounds*. 2003; 2(1):4-12.



Lessons from Large Clinical Intervention Trials: Better Control Means Fewer Complications

Complications





Two Main Types of Diabetes

Type 1 diabetes

Pancreas makes too little or no insulin

Type 2 diabetes

Cells do not use insulin well (insulin resistance) Ability for pancreas to make insulin decreases over time



Obesity Prevalence in Adults



Diabetes Prevalence in Adults



Source: CDC



Diabetes in the United States

- More than 29 million people in the U.S. have diabetes
 - •8.1 million people with diabetes are undiagnosed
 - •9.3% of the U.S. population

•1.7 million Americans aged 20 years or older were newly diagnosed with diabetes in 2010

• Every 19 seconds, someone is diagnosed with diabetes

Source: National Diabetes Fact Sheet, 2014



Burden of Diabetes

- •The leading cause of:
 - new blindness among adults
 - •kidney failure
 - non-traumatic lower-limb amputations
- Increases the risk of heart attack and stroke by 2-4 fold
- •7th leading cause of death
- •Mortality rates 2-4 times greater than non-diabetic people of the same age

Source: Centers for Disease Control and Prevention



Burden of Diabetes in the United States

- •Total direct and indirect cost of diagnosed diabetes is \$245 billion a year
- •Total diabetes-related costs are more when you add gestational diabetes, prediabetes, and undiagnosed diabetes
- •1 in 5 health care dollars is spent caring for someone with diagnosed diabetes
- 1 in 10 health care dollars is attributed directly to diabetes



Type 1 Diabetes



- •1 in 20 people with diabetes have type 1
- Most people are under age 20 when diagnosed
- Body can no longer make insulin
- Insulin is always
 needed for treatment



Symptoms of Type 1 Diabetes

Symptoms usually start suddenly

- •Weight loss
- Loss of energy
- Increased thirst
- Frequent urination
- •Diabetic ketoacidosis (emergency condition of nausea, vomiting, dehydration; can lead to coma)





Managing Type 1 Diabetes



- •Blood glucose monitoring
- Education
- •Healthy food choices
- Physical activity
- Insulin



Before and After Insulin Treatment

Discovery of insulin in 1921 changed type 1 from a death sentence to a chronic disease

Sli Lilly and Company Ltd.

12 Michae 10 I ASWIN 3 Discovery

7-year-old child before and 3 months after insulin therapy



Type 2 Diabetes

•Most people with diabetes have type 2

•Most people are over age 40 when diagnosed, but type 2 is becoming more common among younger adults, children and teens

- •Type 2 is more likely in people who:
 - •Are overweight
 - •Are non-Caucasian
 - •Have a family history of type
 - 2 diabetes





Symptoms of Type 2 Diabetes

•Usually subtle or no symptoms in early stages:

- •Weight loss
- Increased thirst
- Increased urination
- •Feeling tired
- •Blurred vision
- •More frequent infections
- •Symptoms may be mistaken for other situations or problems
- •1 in 4 with type 2 aren't aware they have it





Risk Factors for Type 2 Diabetes

- •Being overweight/obese
- •Sedentary lifestyle
- Family history of diabetes
- History of gestational diabetes
- •Age
- •Ethnic/racial background:
 - •Black/African American
 - •Hispanic/Latino
 - Native American
 - Asian American





Treatment for Type 2 Diabetes May Change Over a Lifetime





Always Includes:

- Education
- •Healthy eating
- Blood glucose monitoring
- Physical Activity

May Include:

•Medications, including insulin

Sites of Action of Antidiabetic Agents for T2DM





Gestational Diabetes

- When a woman is diagnosed for the first time with diabetes and it is during a pregnancy
- This occurs in 5% of all pregnancies
- As pregnancy continues, insulin resistance increases. The placenta makes hormones that can lead to a buildup of sugar in the blood



Gestational Diabetes

- A patient is are more likely to get gestational diabetes if:
 - She was overweight before she got pregnant
 - She is African-American, Asian, Hispanic, or Native American
 - Her prepregnancy blood sugar levels were high, but not high enough to diagnose Type 2 diabetes
 - Diabetes runs in her family
 - She has had gestational diabetes before



What is Prediabetes?



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1 in 3 American adults
(86 million) have
prediabetes

- •Occurs before type 2 diabetes
- •Blood glucose levels are higher than normal but not yet diabetes
- Most people with prediabetes don't know they have it

Is There Any Good News?

- •Yes, we can reduce the chances of developing type 2 diabetes in high-risk people (weight loss, exercise, medications)
- •Yes, we can reduce the chances of developing diabetes complications through:
 - •Blood glucose control (diet, monitoring, medication)
 - •Blood pressure control
 - Cholesterol control
 - •Regular visits to healthcare providers
 - •Early detection and treatment of complications



Preventive Efforts Are Key

- •Most of the diabetes costs are due to end-stage complications
- Investment of resources into early diagnosis, patient education, prevention and treatments pays off in:
 - •Longer lives
 - Increased productivity
 - •Reduced costs over the long term









SOURCE: Dr. Beresford Swan Dialysis Unit, KEMH. NOTE: All kidney transplants are performed abroad.

4.6.2 Patients treated for end-stage renal failure, 2007



Number of patients per 100,000 population

SOURCE: OECD Health Data 2009. NOTE: Bermuda data only includes kidney transplants that occurred in 2007. It does not include other people who are living with a functioning kidney transplant.



Steps to Lower Your Risk of Diabetes Complications

- Take care of your feet
- See the eye doctor annually
- Practice good oral care at home daily and get your teeth cleaned every 6 months
- Get early treatment for complications



Steps to Lower Your Risk of Diabetes Complications

- A1C < 7
- Monitor your blood sugars at home
- Blood pressure < 130/80
- Cholesterol management with lifestyle changes and medication
- Get help to quit smoking
- Be active
- Make healthy food choices



Always Remember the Basics EAT DRINK MOVE **SLEEP**

HEALTHILY


Choose MyPlate "Menu"

Foods to increase

- Make half your plate fruits and vegetables
- Make at least half your grains whole grains
- Switch to fat-free or low fat (1%) milk





Enjoy — but eat less!



Reality Check

 It is possible to be overweight or obese and malnourished

 Survival eating vs. Stress eating vs. Mindful eating



Childhood Obesity

- 24% 33% of 2 5 year olds are overweight or obese
- Obesity rates for young children doubled in about a 20 year period of time (1980's – 2000)
- Obese children are more likely to become obese adults
- If children are overweight, obesity in adulthood is likely to be more severe



Bermuda 2016

75% of Bermudians are overweight (BMI 25.1-29.9) or obese (BMI 30.0 or greater)



Obesity increases likelihood of other diseases and health problems

- Type 2 diabetes
- Heart Disease
- Cancer
- Sleep apnea and respiratory problems
- Hypertension
- High cholesterol

- Stroke
- Osteoarthritis
- Gynecologic problems
- Liver and gallbladder disease
- Gout
- Skin infections



Eat until "satisfied," not "full"

Your stomach shouldn't be a waist (waste) basket.









It takes about 20 minutes for your stomach to tell your brain you're full



Downsize portion size

The bigger the portion, the more people tend to eat





Limit foods high in sodium, added sugars, and refined grains





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Nutrient-dense foods and beverages include ALL:

- Vegetables/fruits
- Whole grains
- Seafood
- Eggs
- Dry beans/peas
- Unsalted nuts/seeds
- Fat-free/low-fat milk/milk products
- Lean meats/poultry

When prepared WITHOUT adding solid fats, sugars, or salt



•Why is everyone talking about sodium?









Fact: Sodium is found in salt.

• All types of salt are high in sodium.

 Kosher salt, sea salt, fleur de sel, gourmet salt and smoked salt all have about the same amount of sodium as table salt. They are not healthier choices.



Fact: We eat too much sodium.

- We all need some sodium, but most of us eat about 3400 mg per day. This is more than double the amount of sodium we need.
- Healthy adults need only 1500 mg of sodium per day. Healthy children need only 1000-1500 mg of sodium per day.



- **Fact:** Eating too much sodium can be harmful to our health.
- Eating too much sodium can cause high blood pressure, stroke, heart disease and kidney disease.
- It may also increase you risk of osteoporosis, stomach cancer and increased severity of asthma.



Fact: Most of the foods we eat contain too much sodium.



Easy ways to reduce sodium

- One teaspoon of salt contains
 2300mg of sodium
- Check labels
- Avoid adding salt (an exception may be when baking yeast breads)
- Eat fresh foods, frozen veggies
- Request salt be left off when eating out
- Use other seasonings





Want to Eat Less Sodium?

Try these Tips!







•Tips for Vegetables and Fruit

- Try fresh vegetables and fruit for snack instead of packaged snacks.
- Rinse canned vegetables to wash away the sodium.
- Flavour food with herbs and spices instead of salt, celery salt, garlic salt or onion salt.

Tips for Grain Products

- Cook pasta in unsalted water.
- Cook rice, barley and quinoa in water or "no salt added" broth instead of salty broth.



• Try unsalted margarine or unsalted butter.



Pick a variety of vegetables from each vegetable subgroup





At least half your grains should be whole grains



Tips for Milk and Alternatives

- Enjoy lower fat unflavoured milk or fortified soy beverages
- Compare Nutrition Facts tables. Buy the products with the lowest amount of sodium.

Tips for Meat and Alternatives

- Buy unseasoned meat, poultry, fish, seafood and tofu.
- Choose unsalted nuts.
- Buy low sodium canned beans or try dried beans, peas, and lentils.







Switching to fat-free or low-fat (1%) milk makes a difference!



Know what's generally high in sodium:

Most processed foods found in the grocery store are high in sodium. These include:

- •canned, packaged or pre-made sauces, dips, gravies, condiments and dressings
- •canned soups
- •deli and luncheon meats
- •frozen meals
- pizza
- processed cheese and cheese spreads
- ready-to-eat foods (like those found at the take-out counter)
- •snack foods (such as chips and salted nuts)



For more hints on finding products with less sodium, look at the nutrient claims on the front of packages:

- Free: none or hardly any of this nutrient
- an example is "sodium free"

No Salt Added: no salt was added during processing

- contains very little sodium
- Low: a small amount
- an example is "low sodium"

Reduced: at least 2% less of the nutrient compared with a similar product

- an example is "reduced sodium"



Use the Nutrition Facts table to compare and choose foods...

- Nutrition Facts tables are on pre-packaged foods.
- The calories and nutrients listed are for the amount of food found at the top of the Nutrition Facts table.

Nutrition Fa Per 3/4 cup (175 g)	cts
Amount % Dai	ily Value
Calories 160	
Fat 2.5 g	4 %
Saturated 1.5 g + Trans 0 g	8%
Cholesterol 10 mg	
Sodium 75 mg	3 %
Carbohydrate 25 g	8 %
Fibre 0 g	0 %
Sugars 24 g	
Protein 8g	
Vitamin A 2 % Calcium 20% Iron	0%



Use the Nutrition Facts table to...

- Choose products more easily.
- Compare two products to make better food choices for you and your family.
- Learn about the nutrition information of the foods you eat.
- Better manage special diets.
- Increase or decrease your intake of any nutrient.



The % Daily Value is easy to use...

•Just follow the 3 steps:	Nutrition Facts	
	Per 125 mL (87 g)	
	Amount % [Daily Value
1)LOOK at the amount of food	Calories 80	\sim
	Fat 0.5 g	1 %
	Saturated 0 g + Trans 0 g	0 %
	Cholosterol 0 mg	
2)READ the % DV	Sodium 0 mg	0 %
	Carbohydrate 18 g	6 %
	Fibre 2 g	8 %
	Sugars 2 g	
	Protein 3 g	
	Vitamin A 2 % Vitamin C	10 %
3)CHOOSE	Calcium 0 % Iron	2 %



What to LOOK for

1) LOOK at the amount of food

• Nutrition Facts are based on

a specific amount of food.

- Compare this to the amount you
- actually eat.





2) READ the % DV

• It helps you see if a specific amount of food has a little or a lot of a nutrient

- 5% DV or less is a little.
- 15% DV or more is a lot.





3) CHOOSE

• Make a better choice for you. Here are some nutrients you may want...

MORE of...

- · Fiber
- · Vitamin A
- · Calcium
- · Iron

LESS of...

- Sodium
- Fat
- Saturated and trans fats



Tips for Vegetables and Fruit

- Ask for salad dressings "on the side", and use only small amounts.
- Choose stir-fry vegetables with garlic instead of stir-fry vegetables in oyster sauce.

Tips for Grain Products

- Order smaller portions or share with someone.
- Choose roti or chapatti instead of naan or parantha.







Tips for Milk and Alternatives

•When ordering pizza, ask for half the cheese.

Tips for Meat and Alternatives

- Choose a grilled or roasted chicken sandwich. instead of chicken wings or chicken fingers
- Ask for your meal to be cooked without salt.







Reduce sugar-sweetened beverage intake:



Drink fewer sugarsweetened beverages

Consume smaller portions

Substitute water, unsweetened coffee and tea, and other beverages with few or no calories


Conscientious drinking habits: How bad is caffeine?

- Average adult consumes 300mg caffeine/day (2-4 cups)
 - Considered moderate
- Average teen consumes over 1200mg caffeine/day (13 cups)
 - Starbuck's drinks: iced coffee, chai tea, mocha (small 150mg; Grande 320mg)
 - Sports drinks with added caffeine: Gatorade, Powerade
 - Energy Drinks: Red Bull, Amp, Monster (150mg)
 - Soda (35-55mg/can)
 - Candy/chocolate



Negative effects of caffeine

- Sleep deprivation
 - Inattention and learning issues
- Increased impulsivity
 - Sensation seeking and risk-taking behaviors
- Nervousness and jitteriness
- Cardiac arrhythmias

Trends in Caffeine Intake Among US Children and Adolescents (Pediatrics 2014; 133: 386-93).



Soda and Sugar

- There is <u>NO</u> nutritional value is soda
 - 20 oz. soda=2+ cups sugar=2x rec daily intake of sugar
 - 80-120% increase in cavities and erosion of tooth enamel
- If I drink too much soda, then how much should I drink? **<u>NONE</u>**
 - 1 sugary drink/day increases risk for obesity by 60%
 - Sugary drink consumers less likely to drink plain water
- Diet soda (artificial sweeteners) makes you fat
 - Brown RJ, de Banate MA, Rother KI, Int J Pediatr Obes. 2010 Aug; 5(4):305-12.
- Party snacks
 - 12oz can soda: 130kcal (9% added sugar)
 - ¾ cup chocolate puffed corn cereal: 51kcal (47%)
 - 1 chocolate chip cookie: 16kcal (34%)



Physical activity and diet important regardless of weight!



Current Recommendations for Routine Physical Activity

 The Endocrine Society recommends 60 minutes of daily moderate to vigorous physical activity and a decrease in "screen time".

Prevention and Treatment of Pediatric Obesity: An Endocrine Society Clinical Practice Guideline Based on Expert Opinion. Journal of Clinical Endocrinology and Metabolism, December 2008; 93 (12):4576-4599.





Moderate aerobic activity increases breathing and heart rate (walking, dancing, swimming, bicycling)



Short on time?

Get active 10 minutes 3 times a day



Consistent restorative sleep





Consistent restorative sleep

- Children and adolescents grow at night when they sleep
- Sleep restores the mind, muscles, and bone for everyone
 - Less healing time and increases in new and sustained injury
- Circadian Rhythms
 - Growth hormone
 - Cortisol
 - Testosterone
 - Melatonin
- People who sleep less consume more calories at night leading to weight gain
 - Shorter sleepers stay up longer, become aware of duration from prior meal, and require another feeding



Remember...





"I think diabetes is affecting my eyesight. I have trouble seeing the consequences of poor food choices."

