Diabetes: Everything You Want to Know

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I have no financial affiliation to disclose as a conflict of interest regarding this presentation.
The IHS Division of Diabetes endorses and supports the current American Diabetes Association (ADA) Clinical Practice Recommendations as the foundation of excellence in diabetes.

The 2008 IHS Standards of Care for Patients With Type 2

Bringing the focus to the specific care issues of American Indian and Alaska Native adults with diabetes, placing greater emphasis on the prevention of complications that are most notable in the this population.
Obesity $4.50
Stroke $5.50
Hypertension $6.50
Cancer $9.50
acanthosis nigricans (uh-kan-THO-sis NIH-grih-kans)
a skin condition characterized by darkened skin patches; common in people whose body is not responding correctly to the insulin that they make in their pancreas (insulin resistance). This skin condition is also seen in people who have pre-diabetes or Type 2 diabetes.
Symptoms of diabetes

- Excess urine
- Fatigue
- Vision changes
- Thirst
- Infection
- Hunger
- Neuropathy
- Nephropathy
- Peripheral vascular disease
- Retinopathy
- Coronary heart disease
- Stroke

Diabetes related complications
Motivational Interviewing

• Are you concerned about your weight?
• How willing are you to make a change?
• What would it take to make you more motivated (increase in number scale)
• What are you willing to change?
• Set achievable goals (e.g., 5-2-1-0)
• If they aren’t interested—JUST WALK AWAY!
• Resist the temptation to fire a parting shot....
• But emphasize your concern, readdress another visit
AADE 7

Diabetes Education Curriculum
Guiding Patients to Successful Self-Management
Curriculum Foundation is based on continuum of Outcomes categories

Learning is an immediate outcome

Behavioral is measured over time

Clinical examples are improved A1c

Health status is measured in changes in quality of life
7 Self Care Behaviors

- Being Active
- Healthy Eating
- Taking Medication
- Reducing Risks
- Monitoring
- Healthy Coping
- Problem Solving
1. Being Active

Increasing physical activity
what is the patient capable of?
The different types of physical activities for patients with diabetes
Safety issues
Special considerations
Exercise Blood Sugar Guidelines

- **300**: Do Not Exercise: drink water and take your meds
- **299**: Exercise
- **299**: Eat a snack – 15 g CHO
- **100**: Eat 15 grams snack
  - 1 serving of protein
2. Healthy Eating

Goals for healthy eating

Basic nutrition concepts and terms

How to read labels and measure food

Strategies for eating out

Encourage to see a DM Educator or Registered Dietitian:
  Individualized meal plan
ChooseMyPlate.gov
3. Taking Medications

Safe medication-taking behavior

How there medications work, how to take them, precautions, and important side effects

Injectable medications storage guidelines, injection techniques and disposals of needles
Diabetic Medications

**Metformin** - liver

**Glipizide/Glyburide** - pancreas

**Pioglitizone/Actos** - muscles

**Acarbose** - intestine/guts

**Canagliflozin/Invokana** – kidneys, pee out blood sugars
Carbohydrates are food that turn into blood sugar. Glucose is the body’s blood sugar that gives us energy.
Types of Insulin

(Short acting, intermediate and long acting)

Lispro
Regular
NPH
70/30
Lantus
Detemir/Levemir
Tresiba – 42 hours

NOT INSULIN: Tanzeum/Trulicity/Byetta/Januvia
## A Guide on Insulin Types for People with Diabetes

<table>
<thead>
<tr>
<th>Type</th>
<th>Brand Name</th>
<th>Onset (length of time before insulin reaches bloodstream)</th>
<th>Peak (time period when insulin is most effective)</th>
<th>Duration (how long insulin works for)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rapid-acting</td>
<td>Humalog, Novolog, Apidra</td>
<td>10 - 30 minutes</td>
<td>30 minutes - 3 hours</td>
<td>3 - 5 hours</td>
</tr>
<tr>
<td>Short-acting</td>
<td>Regular (R)</td>
<td>30 minutes - 1 hour</td>
<td>2 - 5 hours</td>
<td>Up to 12 hours</td>
</tr>
<tr>
<td>Intermediate-acting</td>
<td>NPH (N)</td>
<td>1.5 - 4 hours</td>
<td>4 - 12 hours</td>
<td>Up to 24 hours</td>
</tr>
<tr>
<td>Long-acting</td>
<td>Lantus, Levemir</td>
<td>0.8 - 4 hours</td>
<td>Minimal peak</td>
<td>Up to 24 hours</td>
</tr>
</tbody>
</table>
Byetta
(This is not insulin)

1. Helps the pancreas release insulin when needed
2. Stops the release of a hormone that triggers the liver to make sugar when it's not needed
3. Improves insulin response after meals
4. Slows down how quickly the stomach empties, sending sugar into the blood more slowly
5. Helps reduce the amount of food you eat (BYETTA is NOT a weight-loss product)
Insulin goes right in the blood vessels effecting blood sugars

Glucose

Insulin

key

Insulin is needed for glucose to get inside the cell so that it may be used up to make energy.
4. Reducing Risks

Cardiovascular, kidney, eye, nerve health, foot, skin, dental care and immunizations

Before and during pregnancy

Traveling

Sexual dysfunction
Know Your Numbers
# Chart of Normal and Elevated HbA1c Levels

<table>
<thead>
<tr>
<th>Diagnosis*</th>
<th>A1C Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
<td>Below 5.7 %</td>
</tr>
<tr>
<td>Prediabetes</td>
<td>5.7% to 6.4%</td>
</tr>
<tr>
<td>Diabetes</td>
<td>6.5% or greater</td>
</tr>
</tbody>
</table>

*Any test for diagnosis of diabetes requires confirmation with a second measurement unless there are clear symptoms of diabetes.

SOURCE: Centers for Disease Control and Prevention
Most immediate concerns in managing diabetes

- **Hypoglycemia** = low blood glucose

- **Hyperglycemia** = high blood glucose

- **Ketoacidosis** (key-toe-ass-i-DOE-sis) = ketone (acid) build up in the blood because there is not enough insulin in the body
The ABC’s of Diabetes Management

A is for A1c
B is for Blood Pressure
C is for Cholesterol

These three sets of numbers help you understand how well you are managing your diabetes.
What do the ABC’s mean?

**A1c** is a person’s blood sugar average over 3 months.

**Blood Pressure** measures how much work the heart has to do.

**Cholesterol** measures how much fat is in the blood.
What do the numbers mean?

We’ll see all the ABC’s (A1c, Blood Pressure, and Cholesterol) as three sets of numbers. They’ll be next to stoplights.

**Red means stop and think.** Call your healthcare provider and find out what you need to do.

**Yellow means caution.** Make changes to improve your numbers. Talk with your healthcare team to find out how you can make things better.

**Green is great!** Keeping your ABC’s in the green zone means good health and well-managed diabetes.
A1c
Amount of Blood Sugar that has stuck
to hemoglobin the past 2–3 months.

Blood Sugar
Average Blood Sugar level
over the past 2–3 months.

13%  330
12%  300
11%  270
10%  240
9%   210
8%   180
7%   150
6%   120
5%   90
4%   60
B is for Blood Pressure

The blood pressure targets set by NICE are slightly different depending on your type of diabetes.

Type 1 diabetes: Below 135/85 mmHg
If you have diabetic nephropathy (kidney disease) or two signs of metabolic syndrome, the target is 130/80 mmHg.

Type 2 diabetes: Below 140/80 mmHg
If you have nephropathy, retinopathy or have cerebrovascular disease (which includes stroke) the target is 130/80 mmHg.

The NHS regards an ideal blood pressure reading as being below 120/80 mmHg.
How to control blood pressure

Ways to reach or maintain a healthy blood pressure include:
Make healthy food choices, and eat less salt,
Be physically active every day,
Stay at a healthy weight,
Take blood pressure medicines as prescribed,
Stop habitual tobacco use,
Drink less alcohol.
There are many types of blood fats, sometimes called lipids.

Most body fat is made of triglycerides. Triglycerides are the fat carried in your blood.

Cholesterol is one type of blood fat.

There are two types of cholesterol, LDL and HDL.
Blood Fats Measured Yearly

- Triglycerides
- Cholesterol
  - LDL (lousy)
  - HDL (healthy)
C is for Cholesterol

Healthy HDL levels for men are 45 or more.
Women should have HDL levels of 55 or more.
Heart attack and symptoms

"Classic" heart attack symptoms are typical in men. Although women may experience similar symptoms, they often exhibit less intense, but still dangerous signs of heart attack.

<table>
<thead>
<tr>
<th>Common in Men &amp; Women</th>
<th>Common in Women</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crushing chest pain</td>
<td>Profound sense of fatigue</td>
</tr>
<tr>
<td>Cold and profuse sweating</td>
<td>Shortness of breath</td>
</tr>
<tr>
<td>Nausea</td>
<td>Flu-like discomfort</td>
</tr>
<tr>
<td>Pain radiating to neck or left arm</td>
<td>Feeling of indigestion, heartburn</td>
</tr>
<tr>
<td>Sudden onset of symptoms</td>
<td>Symptoms for a number of days</td>
</tr>
</tbody>
</table>

Source: Susan Butler, RN, Women’s Heart Health coordinator, Wake Forest Baptist Health
C is for Cholesterol

Normal Coronary Artery

Fatty Streak

Fibrous Plaque

Complicated Plaque
What is Neuropathy

nerve damage
Types of Nerve Damage

**Sensory**
Damage to sensory nerves causes pain or loss of feeling

**Motor**
Damage to motor nerves causes muscle weakness

**Autonomic**
Damage to autonomic nerves causes changes in the way the body controls certain functions
Signs & Symptoms of Nerve Damage

**Extremities (Hands, legs & feet)**
- Burning numbness or tingling feeling in the hands, legs, and feet
- Loss of feeling for pain, cold, heat and touch

**Bladder & Urinary System**
- Loss of feeling to urinate
- Loss of control of bladder muscles

**Stomach & Intestines**
- Feeling bloated and full after meals
- Nausea, vomiting, constipation, diarrhea
- Trouble controlling blood sugar
Sexual concerns

Men
Impotence (trouble getting an erection)
*Could be side effect of a medicine you are taking or it could be hormonal*

Women
Vaginal dryness (less vaginal fluid and frequent infections)
*Caused by less blood flow to a woman’s sex organs*
Painful intercourse due to genital infections or lack of lubrication
Weaker orgasms or none at all
Medical treatment available

Keeping blood sugar at target goal
Counseling
Medicine changes
Hormone regulation
Penile Implants
Viagra
Treating vaginal infections and lack of vaginal lubrication
5. Monitoring

Glucose monitoring parameters
Target ranges
Hands on practice of monitoring techniques
Emphasis is placed on timing and frequency of monitoring
How to interpret and respond to the results
# Target Blood Sugar Levels for Diabetes

<table>
<thead>
<tr>
<th>Time</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fasting</td>
<td>less than 100</td>
</tr>
<tr>
<td>Before Meal</td>
<td>70-130</td>
</tr>
<tr>
<td>After Meal (1-2hrs)</td>
<td>less than 180</td>
</tr>
<tr>
<td>Before Exercise</td>
<td>if taking insulin, at least 100</td>
</tr>
<tr>
<td>Bedtime</td>
<td>100-140</td>
</tr>
</tbody>
</table>

Amounts shown above mg/dL

- **A1c**: less than or around 7.0%

These are general medical guidelines. Please follow your doctor’s instructions.
Trend Report - bG - All
08/14/2016 - 08/27/2016

bG - All Statistics
# of tests: 42  Avg tests/day: 3.0  # of meal test pairs: 0
Average (mg/dL): 131  # HI: 0  Average meal rise: 0
SD (mg/dL): 26.6  # LO: 0
Highest (mg/dL): 193  LBG: 0.1
Lowest (mg/dL): 95  HBG: 1.8

Key
× Measurement
× Multiple measurements
Average
bG - All target range
bG - All hypo limit
Non-work day
6. Healthy Coping

Coping with the demands of diabetes transcends any one self-care behavior
Diagnoses of diabetes
Recognizing and dealing with depression and anxiety
Exploring feeling related to diabetes
Motivation for self-care, relapse prevention, stress management, support systems
Depression screening planned to be implemented
7. Problem Solving

Goal setting activities

Develop patient’s problem solving skills pertaining to:
- Hypoglycemia,
- Hyperglycemia
- Sick day management
Diabetes Complications

Major COMPLICATIONS from diabetes

- Wounds in foot that won’t heal, leading to AMPUTATION
- HEART DISEASE
  - Damaged blood vessels in retina which can cause BLINDNESS
- STROKE
- KIDNEY FAILURE
Gestational Diabetes

High blood glucose levels in mother

Brings extra glucose to baby

Causes baby to put on extra weight

(1) Mother’s blood brings extra glucose to fetus
(2) Fetus makes more insulin to handle the extra glucose
(3) Extra glucose gets stored as fat and fetus becomes larger than normal
2.3 Management of elevated blood glucose

2.3a – Target blood glucose levels close to normal

2.3b - Medical Nutrition therapy +
Daily moderate exercise (≥ 30 min)

If hyperglycemia persists

2.3c - Blood glucose-lowering pharmacological therapy
Gestational Diabetes (GDM) Blood Sugar Range

Before a meal (preprandial): 95 mg/dl or less

1-hour after a meal (postprandial): 140 mg/dl or less

2-hours after a meal (postprandial): 120 mg/dl or less

American Diabetes Association, 2017
Maternal Complications of GDM

During Pregnancy
- Abortion
- Preterm labour (due to infection or polyhydramnios)
- Pre-eclampsia
- Polyhydramnios
- Maternal distress due to oversized fetus and polyhydramnios
- Microangiopathy
  - Nephropathy, retinopathy, neuropathy
- Large vessel disease
  - Coronary artery disease
  - Thromboembolic disease
  - Infection
  - Hypo and hyperglycaemia

During labour
- Prolonged labour
- Shoulder dystocia
- Perineal injuries
- PPH
- Operative interference
- Increased risk of Caesarean delivery

Puerperium
- Puerperal sepsis
- Lactational failure
Diabetes Information

- Visit www.diabetes.org/schools
- Visit www.diabetes.org/safeatschool
- Download the following free tools:
  - For More Information:
    - NDEP’s Helping the Student with Diabetes Succeed: A Guide for School Personnel
    - ADA’s Diabetes Care Tasks at School: What Key Personnel Need to Know
- Visit www.diabetes.org/schoolwalk for free lesson plans about diabetes
Thank You