

Tishk International University
Faculty of Nursing
Nursing Department



Adult Nursing II

Diabetes Mellitus

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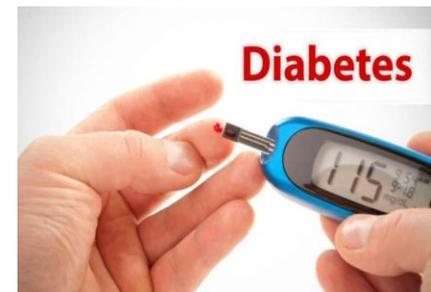
Outline

- What is diabetes?
- Type of diabetes
- Symptoms of diabetes
- Cause of diabetes
- Diabetes risk factors
- Diabetes complication
- Diabetes treatment
- Nursing care of diabetic patients

Diabetes Mellitus



- Diabetes mellitus (DM), is a metabolic disease that causes high blood sugar.
- The hormone insulin moves sugar from the blood into cells to be stored or used for energy.
- With diabetes, the body either doesn't make enough insulin or can't effectively use the insulin it does make.



Type of Diabetes Mellitus



1. Type 1 diabetes: also called Insulin Dependent Diabetes Mellitus (IDDM), is an autoimmune disease.

- The immune system attacks and destroys cells in the pancreas, where insulin is made.
- It's unclear what causes this attack.
- About 10 percent of people with diabetes have this type.

Type of Diabetes Mellitus



2. Type 2 diabetes: also called Non-Insulin Dependent Diabetes Mellitus (NIDDM) occurs when the body becomes resistant to insulin, and sugar builds up in the blood.

- Prediabetes occurs when the blood sugar is higher than normal, but it's not high enough for a diagnosis of type 2 diabetes.

Type of Diabetes Mellitus



3. Gestational diabetes (GDM): is high blood sugar during pregnancy.

- Insulin-blocking hormones produced by the placenta cause this type of diabetes.



- A rare condition called diabetes insipidus is not related to diabetes mellitus, although it has a similar name.
- It's a different condition in which the kidneys remove too much fluid from the body.

Symptoms of Diabetes Mellitus



The general symptoms of diabetes include:

1. Increased hunger (polyphagia)
2. Increased thirst (polydipsia)
3. Frequent urination (polyuria)
4. Weight loss
5. Blurry vision
6. Extreme fatigue
7. Sores that don't heal
8. Tiredness
9. Recurring of infections.



Symptoms in men

In addition to the general symptoms of diabetes, men with diabetes may have a decreased sex drive, erectile dysfunction (ED), and poor muscle strength.

Symptoms in women

Women with diabetes can also have symptoms such as urinary tract infections, yeast infections, and dry, itchy skin.



Symptoms of Gestational diabetes

- Most women with gestational diabetes don't have any symptoms.
- The condition is often detected during a routine blood sugar test or oral glucose tolerance test that is usually performed between the 24th and 28th weeks of gestation.
- In rare cases, a woman with gestational diabetes will also experience increased thirst or urination.

Causes of Diabetes Mellitus



Causes of Type 1 diabetes

1. Don't know exactly what are the causes type 1 diabetes (idiopathic)=unknown cause.
2. For some reason, the immune system mistakenly attacks and destroys insulin-producing beta cells in the pancreas.
3. Genes may play a role in some people.
4. It's also possible that a virus sets off the immune system attack.

Causes of Diabetes Mellitus



Causes of Type 2 diabetes

1. Type 2 diabetes stems from a combination of genetics and lifestyle factors.
2. Being overweight or obese increases the risk too. Carrying extra weight, especially in the belly, make the cells more resistant to the effects of insulin on the blood sugar.
3. This condition runs in families. Family members share genes that make them more likely to get type 2 diabetes and to be overweight.

Causes of Diabetes Mellitus



Causes of Gestational diabetes

1. Gestational diabetes is the result of hormonal changes during pregnancy. The placenta produces hormones that make a pregnant woman's cells less sensitive to the effects of insulin. This can cause high blood sugar during pregnancy.
2. Women who are overweight when they get pregnant or who gain too much weight during their pregnancy are more likely to get gestational diabetes.

Risk factors of Diabetes Mellitus



Certain factors increase the risk for diabetes.

Risk factors of Type 1 diabetes

- The body more likely to get type 1 diabetes if a child or teenager, that have a parent or sibling with the condition, or carry certain genes that are linked to the disease.

Risk factors of Type 2 diabetes



1. Overweight
2. Age 45 or older
3. Have a parent or sibling with the condition
4. Aren't physically active
5. Have had gestational diabetes
6. Have prediabetes
7. Have high blood pressure, high cholesterol, or high triglycerides
8. Have African American, Hispanic or Latino American, Alaska native, pacific islander, American Indian, or Asian American ancestry



Risk factors of Gestational diabetes

The risk for gestational diabetes increases if you:

1. Overweight
2. Age over 25
3. Had gestational diabetes during a past pregnancy
4. Have given birth to a baby weighing more than 9 pounds (> 4 Kg)
5. Have a family history of type 2 diabetes
6. Have Polycystic Ovary Syndrome (PCOS)

Diabetes diagnosis



- Anyone who has symptoms of diabetes or is at risk for the disease should be tested.
- Women are routinely tested for gestational diabetes during their second or third trimesters of pregnancy.

Blood Tests to Detect Diabetes



The following are blood tests using for diagnose prediabetes and diabetes:

1. **HbA1c test**: Provides a snapshot of the blood sugar levels over the previous 3 months.
2. **Fasting Plasma Glucose (FPG)**: Commonly called Fasting Blood Sugar (FBS), that measures the blood sugar after fasting for 8 hours.
3. **Oral Tolerance Glucose Test (OTGT)**: The glucose tolerance test, measures the body's response to sugar (glucose). It can be used to screen for type 2 diabetes. More commonly, a modified version of the glucose tolerance test is used to diagnose gestational diabetes.
4. **Random Plasma Glucose (FPG)**: Commonly called Random Blood Sugar (RBS), that measures the blood sugar after meal.

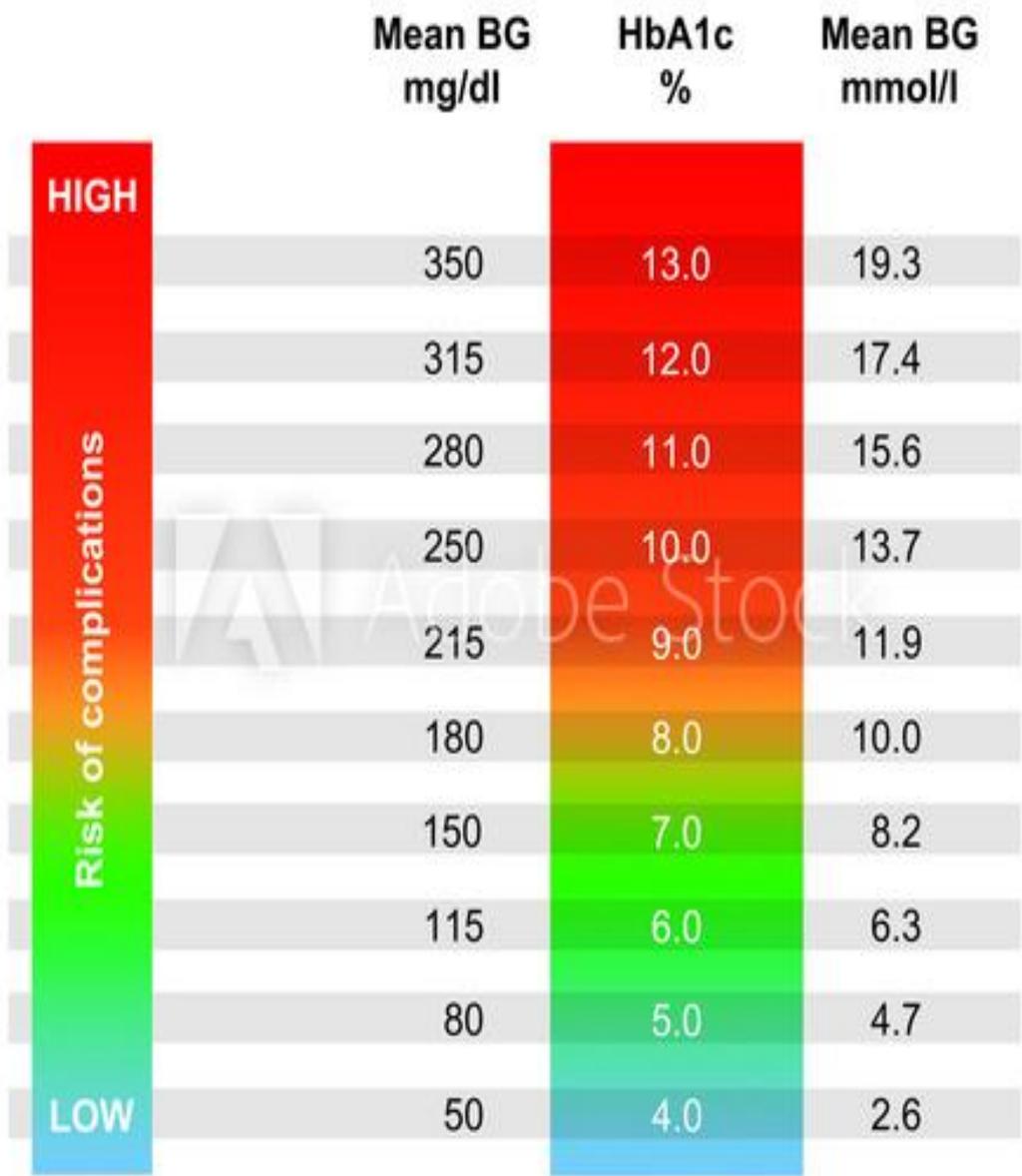


BLOOD TEST TO DETECT DIABETES

American Diabetes Association. Classification and diagnosis of diabetes. *Diabetes Care*. 2016;39(Suppl. 1):S13–S22.

Diagnosis	A1C (percent)	Fasting plasma glucose (FPG) mg/dL	Oral glucose tolerance test (OGTT) At 2 hours after drinking 75 grams of glucose (for pregnant is different)	Random plasma glucose test (RPG) ^a
Normal	below 5.7	99 or below	139 or below	
Prediabetes	5.7 to 6.4	100 to 125	140 to 199	
Diabetes	6.5 or above	126 or above	200 or above	200 or above

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Complications of Diabetes Mellitus



High blood sugar damages organs and tissues throughout the body. The higher blood sugar is and the longer live with it, the greater risk for complications.

1. Heart disease, heart attack, and stroke
2. Neuropathy
3. Nephropathy
4. Retinopathy and vision loss
5. Hearing loss
6. Foot damage (diabetic foot) infections and sores that don't heal
7. Skin conditions such as bacterial and fungal infections
8. Depression
9. Dementia



Complications of Gestational diabetes

Uncontrolled gestational diabetes can lead to problems that affect both the mother and baby.

A) Complications affecting the **baby** can include:

1. Premature birth
2. Higher-than-normal weight at birth
3. Increased risk for type 2 diabetes later in life
4. Low blood sugar
5. Jaundice
6. Stillbirth: is the delivery, after the 20th week of pregnancy, of a baby who has died. Loss of a baby before the 20th week of pregnancy is called a miscarriage.



Complications of Gestational diabetes

Uncontrolled gestational diabetes can lead to problems that affect both the mother and baby.

B) Complications affecting the **mother can include:**

1. high blood pressure (preeclampsia) or type 2 diabetes.
2. She may also require cesarean section (CS) delivery.
3. The mother's risk of gestational diabetes in future pregnancies also increases.

Treatment of Diabetes Mellitus



- Diabetes may treat with a few different medications. Some of these drugs are taken by mouth, while others are available as injections.

Treatment of Type 1 diabetes

- **Insulin** is the main treatment for type 1 diabetes.
- It replaces the hormone that the body isn't able to produce.

Treatment of Diabetes Mellitus



- There are **four types of insulin** that are most commonly used.
- They're differentiated by how quickly they start to work, and how long their effects last:
 1. **Rapid-acting insulin** starts to work within 15 minutes and its effects last for 3 to 4 hours.
 2. **Short-acting insulin** starts to work within 30 minutes and lasts 6 to 8 hours.
 3. **Intermediate-acting insulin** starts to work within 1 to 2 hours and lasts 12 to 18 hours.
 4. **Long-acting insulin** starts to work a few hours after injection and lasts 24 hours or longer.



Treatment of Type 2 diabetes

- Diet and exercise can help some people manage type 2 diabetes.
- If lifestyle changes aren't enough to lower the blood sugar, it needs to take medication.

These drugs lowering blood sugar in a variety of ways



Types of drug	How they work	Example(s)
Alpha-glucosidase inhibitors	Slow your body's breakdown of sugars and starchy foods	Acarbose (Precose) and miglitol (Glyset)
Biguanides	Reduce the amount of glucose your liver makes	Metformin (Glucophage)
DPP-4 inhibitors	Improve your blood sugar without making it drop too low	Linagliptin (Tradjenta), saxagliptin (Onglyza), and sitagliptin (Januvia)
Glucagon-like peptides	Change the way your body produces insulin	Dulaglutide (Trulicity), exenatide (Byetta), and liraglutide (Victoza)
Meglitinides	Stimulate your pancreas to release more insulin	Nateglinide (Starlix) and repaglinide (Prandin)
SGLT2 inhibitors	Release more glucose into the urine	Canagliflozin (Invokana) and dapagliflozin (Farxiga)
Sulfonylureas	Stimulate your pancreas to release more insulin	Glyburide (DiaBeta, Glynase), glipizide (Glucotrol), and glimepiride (Amaryl)
Thiazolidinediones	Help insulin work better	Pioglitazone (Actos) and rosiglitazone (Avandia)

It may need to take more than one of these drugs. Some people with type 2 diabetes also take insulin.



Treatment of Gestational diabetes

- It may need to monitor the blood sugar level several times a day during pregnancy.
- If it's high, dietary changes and exercise may or may not be enough to bring it down.
- According to the Mayo Clinic, about 10 to 20 percent of women with gestational diabetes will need insulin to lower their blood sugar. Insulin is safe for the growing baby.

Nursing care for Diabetic Patients



Diabetic patients need complex nursing care. Here are some of the most important cares for diabetes:

1. Deficient knowledge regarding disease process, treatment, and individual care needs, May be related to

- unfamiliarity with information
- misinterpretation
- lack of recall

2. Risk for unstable blood glucose, May be related to

- lack of adherence to diabetes management
- inadequate blood glucose monitoring practices
- fluctuating physical activity level
- stress



3. Risk for infection, May be related to

- decreased leukocyte function
- circulatory changes due to high blood glucose levels

REVIEW AND AGREE ON MANAGEMENT PLAN

- Review management plan
- Mutual agreement on changes
- Ensure agreed modification of therapy is implemented in a timely fashion to avoid clinical inertia
- Decision cycle undertaken regularly (at least once/twice a year)

ASSESS KEY PATIENT CHARACTERISTICS

- Current lifestyle
- Comorbidities, i.e., ASCVD, CKD, HF
- Clinical characteristics, i.e., age, HbA_{1c}, weight
- Issues such as motivation and depression
- Cultural and socioeconomic context

CONSIDER SPECIFIC FACTORS THAT IMPACT CHOICE OF TREATMENT

- Individualized HbA_{1c} target
- Impact on weight and hypoglycemia
- Side effect profile of medication
- Complexity of regimen, i.e., frequency, mode of administration
- Choose regimen to optimize adherence and persistence
- Access, cost, and availability of medication

SHARED DECISION MAKING TO CREATE A MANAGEMENT PLAN

- Involves an educated and informed patient (and their family/caregiver)
- Seeks patient preferences
- Effective consultation includes motivational interviewing, goal setting, and shared decision making
- Empowers the patient
- Ensures access to DSMES

AGREE ON MANAGEMENT PLAN

- Specify SMART goals:
 - Specific
 - Measurable
 - Achievable
 - Realistic
 - Time limited

IMPLEMENT MANAGEMENT PLAN

- Patients not meeting goals generally should be seen at least every 3 months as long as progress is being made, more frequent contact initially is often desirable for DSMES

ONGOING MONITORING AND SUPPORT INCLUDING:

- Emotional well-being
- Check tolerability of medication
- Monitor glycemic status
- Biofeedback including SMBG, weight, step count, HbA_{1c}, blood pressure, lipids

GOALS OF CARE

- Prevent complications
- Optimize quality of life



ASCVD = Atherosclerotic Cardiovascular Disease

CKD = Chronic Kidney Disease

HF = Heart Failure

DSMES = Diabetes Self-Management Education and Support

SMBG = Self-Monitored Blood Glucose

Implementation of Plan

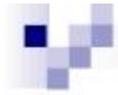


1. **Exercise**: Get at least 150 minutes per week of aerobic exercise, such as walking or cycling.
2. **Diet**: Cut saturated and trans fats, along with refined carbohydrates, out of diet. Eat more fruits, vegetables, and whole grains. Eat smaller portions (small frequent meal).
3. **Weight**: Needs to lose 7 percent of the body weight if overweight or obese.
4. **Medications Regimen**
5. **Self-Monitoring**

Diabetes Prevention



- Type 1 diabetes isn't preventable because it's caused by a problem with the immune system.
- Some causes of type 2 diabetes, such as genes or age, aren't under control.
- Yet many other diabetes risk factors are controllable.
- Most diabetes prevention strategies involve making simple adjustments to the diet and fitness routine as mentioned in the management of diabetes.



THANK YOU FOR
YOUR LISTENING

DO YOU HAVE
ANY QUESTIONS?