Reviewed By
Noura Alturki
Jehad Alorainy

MED438
KING SAUD UNIVERSITY

Community
Medicine
438

Diabetes

Objectives

- List the risk factors of diabetes
- List complications of diabetes
- Discuss preventive measures within the framework of NCDs
- Screening of Diabetes
- Prevention programs in KSA
- **OSCE**

Color Index

- Main text
- Males slides
- Females slides
- Doctor notes
- Important
- Textbook
- Golden notes
- Extra

Editing File

Epidemiology

The studies demonstrated varying prevalence rates in different geographical regions in the country, ranging from 18.2% (in 2004± 2005) in the study conducted in the Eastern province to 31.6% in 2011 in the study conducted in Riyadh.

Type 1 diabetes: due to autoimmune β-cell destruction, usually leading to absolute insulin deficiency

Type 2 diabetes[1]: due to a progressive loss of β-cell insulin secretion frequently on the background of insulin resistance[2]

Classification of diabetes

Gestational diabetes mellitus (GDM): diabetes diagnosed in the second or third trimester of pregnancy that was not present prior to gestation

Specific types of diabetes due to other causes, e.g. maturity-onset diabetes of the young [MODY], and drug induced diabetes (such as with glucocorticoid use,)

Criteria for the diagnosis

No reference values will be given during the OSCE

➢ **FPG:** 126 mg/dL (7.0 mmol/L)[3]. Fasting for at least 8 h.
➢ **OR 2-h PP:** 200 mg/dL (11.1 mmol/L).
➢ **OR A1C:** 6.5%.
➢ **OR** In a patient with **classic symptoms of hyperglycemia** and a random plasma glucose 200 mg/dL (11.1 mmol/L)[4].
➢ In the a**bsence of unequivocal hyperglycemia**, diagnosis requires **two** abnormal test results from the same sample or in **two separate test samples**. (2 FPG / 2 A1C / FPG and A1C/ FPG and 2hpp)

Prediabetes
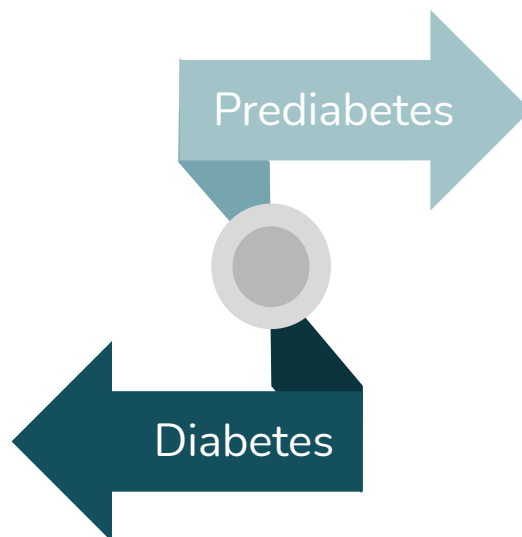
Diabetes

➢ **Normal Fasting Plasma Glucose:** 5.5 mmol/L (99 mg/dL)
➢ **Normal 2-h PP:** < 140 mg/dl (7.8 mmol/L)
➢ **Prediabetes;** Fasting Plasma Glucose: 5.6 – 6.9 mmol/L (100 - 125 mg/dL)
➢ **Prediabetes 2-h PP:** 140- 199 mg/dl (7.8-11 mmol/L)
➢ **Prediabetes;** A1C: 5.7 – 6.4%
➢ The person is at risk to develop diabetes mellitus

1. More common in the clinic
2. Especially among obese patient
3. To get in mmol/L divide by 18 and vice versa.
4. In symptomatic patients one random plasma glucose reading is sufficient to diagnose diabetes.

Criteria for testing for diabetes in asymptomatic adults

1 Testing should be considered in **overweight** or **obese** adults who have **one or more of the following risk factors:**
a. First-degree relative with diabetes
b. History of CVD or Hypertension
c. Women with polycystic ovary syndrome
d. Physical inactivity
e. Conditions associated with insulin resistance (e.g., severe obesity, acanthosis nigricans)

2 Patients with prediabetes should be tested yearly.

3 Women who were diagnosed with GDM even after delivery.

4 For all other patients, testing should begin at age 45 years.

5 If results are normal, testing should be repeated at a **minimum of 3-year intervals**

Figure 2.1—ADA risk test (diabetes.org/socrisktest).

Can be distributed on the world's diabetes day for awareness and educational purposes.

Prevention or delay development of diabetes

- The Diabetes Prevention Program Several major randomized controlled trials, including:

| Diabetes Prevention Program (DPP) | Finnish Diabetes Prevention Study (DPS) | Da Qing Diabetes Prevention Study (Da Qing study) |

- All demonstrated that lifestyle/ behavioral therapy featuring an individualized reduced calorie meal plan is highly effective in preventing type 2 diabetes and improving other cardiometabolic markers (such as blood pressure, lipids, and inflammation).
- The strongest evidence for diabetes prevention comes from the **DPP trial (1)**. The
- DPP demonstrated that an intensive lifestyle intervention could reduce the incidence of type 2 diabetes by 58% over 3 year

❖ **LIFESTYLE INTERVENTIONS**

- Refer patients with prediabetes to an intensive behavioral lifestyle intervention program.
- Based on the Diabetes Prevention Program (DPP) to achieve PREVENTION OR DELAY OF TYPE 2 DIABETES and maintain 7 - 10% loss of initial body weight and increase **moderate-intensity physical activity (such as brisk walking) to at least 150 min/week[1]**. (Evidence: A)

---

1. i.e. at least 30 min, 5 day a week.

Healthy nutrition

Encourage:
- Whole grains, legumes, nuts, fruits, vegetables, and meat with no fat
- **Minimize;** refined and processed foods, like rice, white bread, sugary drinks,
- The use of nonnutritive sweeteners may have the potential to reduce overall calorie and carbohydrate intake if substituted for caloric (sugar) sweeteners.
- **A referral to dietitian (even when you give them diet advice)** is essential to assess the overall nutrition status of, and to work collaboratively with, the patient to create a personalized meal plan that considers the individual's health status, skills, resources, food preferences, and health goals to coordinate and align with the overall treatment plan including physical activity and medication.

Physical activity and tobacco cessation

- Just as **150 min/week** of **moderate intensity physical activity,** such as **brisk walking,** showed beneficial effects in those with prediabetes.
- Moderate intensity physical activity has been shown to improve insulin sensitivity and reduce abdominal fat.
- Tobacco Smoking may **increase the risk of type 2 diabetes;** therefore, evaluation for tobacco use and referral for tobacco cessation, if indicated, should be part of routine care for those at risk for diabetes. We don't expect you to counsel unless it's a separate osce station but always give a brief advice
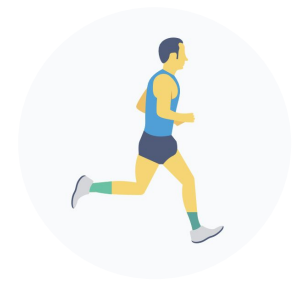
Pharmacologic Interventions

- **Metformin** therapy for prevention of type 2 diabetes should be considered in those with prediabetes, especially for those who are obese and hypertensive.
- **Metformin** and **intensive lifestyle modification** led to an equivalent 50% reduction in diabetes risk.
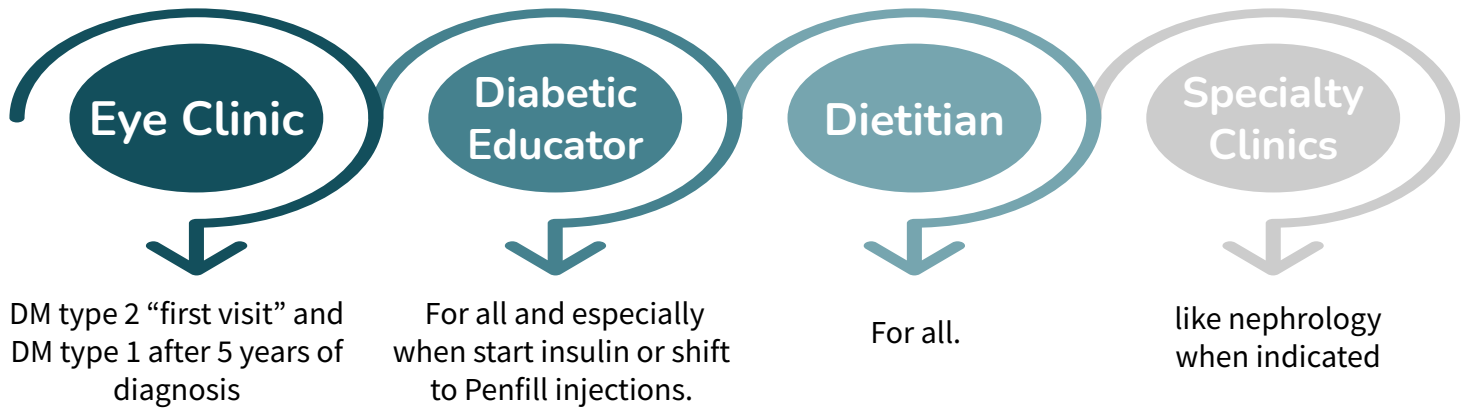
	Complications of DM
Cardiovascular Disease (CVD)	• After 10 years of observational follow-up of the UKPDS, those originally randomized to intensive glycemic control had significant long-term reductions in MI (15% with sulfonylurea or insulin as initial pharmacotherapy, 33% with metformin as initial pharmacotherapy) and in all-cause mortality (13% and 27%,respectively). • DM increase risk of CVD

Chronic kidney disease (CKD)	• **Optimize glucose control** to reduce the risk or slow the progression of chronic kidney disease. A
	• **Optimize blood pressure control** to reduce the risk or slow the progression of chronic kidney disease. A
	Screening by:
	➢ Albumin/Creatinine Ratio to detect Microalbuminuria beside Renal function tests.
	    ○ Normal levels → once a year
	    ○ Abnormal levels → more than once a year, depending on the patient status.

Diabetic Retinopathy	• **Optimize glycemic control** to reduce the risk or slow the progression of diabetic retinopathy. A • **Optimize blood pressure** and **serum lipid control** to reduce the risk or slow the progression of diabetic retinopathy. A **Screening by referring them to the ophthalmology clinic:** ➢ Adults with type 1 diabetes should be referred to an ophthalmologist within 5 years[1] after the onset of diabetes. B ➢ Patients with type 2 diabetes should be referred to an ophthalmologist at the time[2] of the diabetes diagnosis. B
Neuropathy	**Screening by the GP no need for referral to neurology:** ➢ All patients should be assessed for diabetic peripheral neuropathy starting **at diagnosis of type 2 diabetes** and **5 years** after the diagnosis of **type 1 diabetes** and at least annually thereafter. B
Foot care & Diabetic foot	• Perform a comprehensive foot evaluation at least **annually[3]** to identify risk factors for ulcers and amputations. B • The examination should include inspection of the skin,assessment of foot deformities, neurological assessment (monofilament testing with pinprick, temperature, vibration), and vascular assessment including pulses in the legs and feet. B

1. Because the symptoms presents shortly after the onset of insulin deficiency
2. Because the pathological process (hyperglycemia) started years ago
3. However, in each visit ask about the feet and maybe do a general inspection.

The National Executive Plan Includes Seven Objectives:

1 the **primary prevention** from the second type of diabetes, and diminishing incidence rates of the disease through addressing the risk factors causing the disease.

2 **Secondary prevention** from the second type of diabetes through the early detection of the disease and its complications.

3 **Advancing quality** of the health services delivered to the patients suffering from diabetes and its complications.

4 Developing ways of **detecting and following up**, and assessing patients through Diabetics' Registration Program, extent of adherence to the work quality levels, annual follow-up registers, patients' interviews, and healthcare registers of patients.

5 Improving on the **research tools and studies** related to the disease.

6 Enabling diabetics and their families to **contribute** to controlling diabetes and its complications.

7 **Community participation** in controlling diabetes.

Referral of diabetic patients to:

Eye Clinic

DM type 2 "first visit" and DM type 1 after 5 years of diagnosis

Diabetic Educator

For all and especially when start insulin or shift to Penfill injections.

Dietitian

For all.

Specialty Clinics

like nephrology when indicated

- ❖ All diabetic patients especially on insulin will be offered a **Glucometer for home monitoring.**[1]
- ❖ **Multidisciplinary approach** for DIABETIC PATIENTS (Physician, clinical pharmacist, health educator and nutritionist)

Prevention / Health Services in Saudi Arabia

Specialized Centers:
The Ministry of Health (MOH) adopted implementing an objective method in all the fields of health services providing: prevention, treatment, and rehabilitation, through a network of integrated facilities.
- Thus, it established 20 specialized centers for treating diabetics, and eight new more centers are underway across the Saudi Arabia's regions.
- Further, the MOH is working on enhancing the health awareness of each diabetic or anyone vulnerable to develop the disease, and providing the best health and education services.

World Diabetes Day

- The Ministry of Health (MOH) is interested annually in marking the World Diabetes Day, falling on the fourteenth of November of each year.
- This is with the aim of achieving the general goals in terms of boosting up and carrying out the prevention policies and controlling diabetes and its complications.
- Supporting the national initiatives for diabetes control and its complications, and highlighting the importance of evidence- based education with regard to treating diabetes and preventing from its complications.

National Preventive Programs

- The cornerstone of a national preventive program would be the PHCCs.
- However, quality of care at the PHCCs is unsatisfactory.
- A comprehensive review of primary healthcare in Saudi Arabia found that access to health education was limited and referrals to specialist hospitals were low.
- Patients' follow-up system was ineffective.
- Multiple problems with poor quality and time for health education, poor counseling, lack of trust in health-care providers, and difficulty in understanding instructions from health providers due to poor communication.

1. Target levels::
- Post-prandial s180 mg/dl (if above, increase the bolus insulin by 2 unit for 3 day and check again)
- Fasting s 130 mg/dl (if above, increase the basal insulin by 2 unit for 3 day and check again).

Quiz

1- According to new World Health Organization diabetes management guidelines, what is the best diagnostic criterion of diabetes?

A. Oral glucose tolerance test
B. Random blood sugar
 C. Urine analysis
D. Glycosylated hemoglobin

2- 25 y.o woman comes in for an antenatal care appointment, she is 7 months pregnant with twins. Her urine dipstick is showing proteinuria. What is the possible cause?

A.gestational hypertension
 B. Type 1 Diabetes
C. Type 2 Diabetes
D.maturity-onset diabetes of the young [MODY]

3- Which of the following confirmed values meet the diagnostic threshold for diabetes?

A- Random glucose > 160 mg/dl
B- 2 hour post prandial glucose ≥ to 126 mg/dl
C- Fasting blood glucose ≥ 126 mg/dl
D- Fasting blood glucose equal to or greater than 140mg/dl

4- Keeping your diabetes under control early on will help you prevent more health problems later. People with diabetes are at higher risk for which of these?

A- Heart disease
B- Cancer
C- Nerve damage
D- A and C

5- Prediabetes is the term used for individuals that do not meet the criteria for diabetes but are too high to be considered normal. Which of the following statement accurately characterize prediabetes?

A- Fasting blood glucose from 120-180 mg/dL
B- Fasting blood glucose from 126-140 mg/dL
C- Fasting blood glucose from 110-125 mg/dL
D- All of the above

Answers

Q1	Q2	Q3	Q4	Q5
A	A	C	D	C

Thank You and Good Luck

Community Medicine 438

Team Leaders:

Lama AlAssiri | Mohammed AlHuqbani | Ibrahim AlDakhil

Team Members:

- Deema AlMaziad
- Lama AlZamil
- Leen AlMazroa
- Lina AlOsaimi
- Muneera AlKhorayef
- Norah AlHarbi
- Norah AlMazrou 📱
- Nouf Alhussaini 🏅
- Razan AlRabah 📝
- Renad Alhaqbani
- Rema AlMutawa

- Sara AlAbdulkareem
- Sedra Elsirawani 📝
- Wejdan Alnufaie
- Abdulrahman Alhawas
- Abdulrahman Shadid
- Abdullah Aldawood
- Abdullah Shadid
- Alwaleed Alsaleh
- Bader Alshehri
- Bassam Alkhuwaiter
- Faisal Alqifari

- Hameed M. Humaid
- Khalid Alkhani
- Meshari Alzeer
- Mohannad Makkawi
- Nayef Alsaber
- Omar Aldosari
- Omar Alghadir
- Zyad Aldosari