



أصدقاء السكري  
Friends For Diabetes

# A guide to Diabetes



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Friends For Diabetes  
*Supreme Council For Family Affairs*

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المجلس الأعلى لشؤون الأسرة  
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# What is Diabetes?

Glucose comes from the food we eat; it is the body's main source of energy.

The pancreas, a gland that lies between the stomach and liver, plays a major role in controlling the blood glucose level.

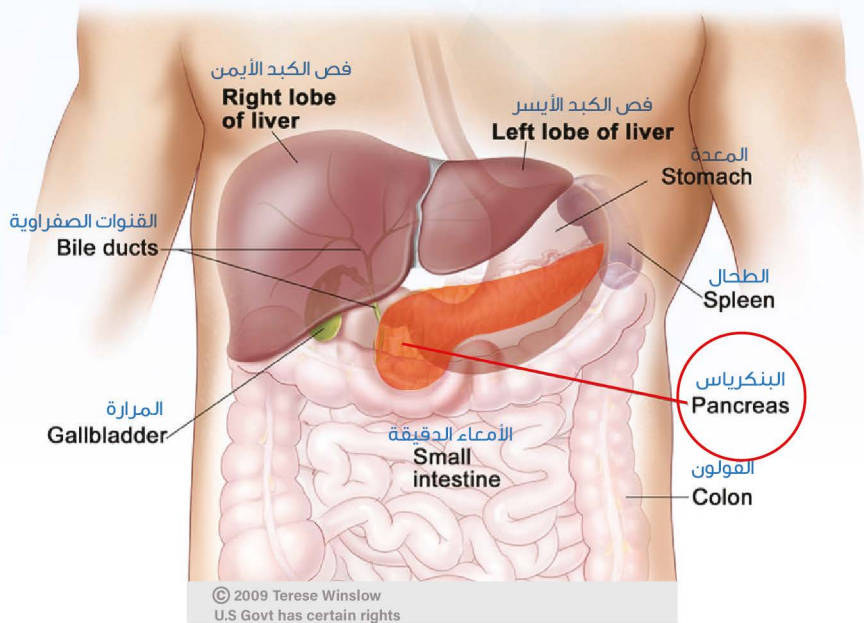
The beta cells of the pancreas produce the required amount of a hormone named Insulin. Insulin helps the uptake of glucose from the blood into the body's cells to produce energy.

If the pancreas does not produce enough insulin, or if the cells in the body do not utilize the insulin properly, the glucose sugar builds up in the blood instead of entering cells.

## Definition of Diabetes:

- Diabetes mellitus is chronic disorder characterized by high levels of blood glucose resulting from defects in insulin production, insulin action or both.
- The blood sugar rises first in the blood then appears in the urine
- Diabetes is a life long disease. If diabetes is not controlled, it results in serious health complications that can affect almost every part of the body.





## In Normal State



Food moves to stomach



It dissociates into sugar particles (glucose)



Glucose enters blood stream



The pancreas secretes insulin



Insulin helps the blood glucose to enter the cells



The glucose feeds the body cells and release energy

# What are the Types of Diabetes?

## Type 1 diabetes

Type 1 diabetes accounts for **5 to 10%** of all cases of diabetes, but is the leading cause of diabetes in children and adolescents. In type 1 Diabetes the immune system destroys the insulin-producing beta cells of the pancreas, rendering them unable to produce insulin.

The autoimmune reaction is due to an inherited genetic susceptibility along with exposure to an environmental factor. Consequently, people with type 1 diabetes produce very little or no insulin and must take insulin by injection or insulin pump. Currently there are many ongoing research to find a solution for prevention and cure of type 1 diabetes.

## Type (1) Diabetes



Food moves to stomach



It dissociates into sugar particles(glucose)



Glucose enters blood stream



The pancreas cannot secrete enough insulin



Blood glucose remains high and cannot enter the cells



Treatment with insulin is needed

## Type 2 Diabetes

Type 2 Diabetes is the most common type of diabetes, accounting for up to **90 %** of all cases of diabetes. In Type 2 Diabetes, the pancreas produces insulin, but the insulin does not work properly, which is also called “insulin resistance”.

Type 2 Diabetes used to occur mainly in adults who were overweight and aged above 40. Recently, however, as more children and adolescents are becoming overweight and inactive, type 2 diabetes is occurring increasingly in younger people.

**Type 2 Diabetes can be prevented in many cases by maintaining a healthy weight and being physically active.**

## Type (2) Diabetes



Food moves to stomach



It dissociates into sugar particles(glucose)



Glucose enters blood stream



The pancreas secretes insulin but the cells do not respond to it well



Blood glucose remains high and cannot enter the cells



Treatment with weight control and drugs if necessary

## Other types of diabetes



Diabetes secondary to drugs  
or other disease



Gestational diabetes  
(pregnancy related)

## Who is at risk of Diabetes?

Diabetes does not transmit from a person to another, but certain factors can put you at risk of developing type 2 Diabetes:

- Being over 45 years
- Being overweight (BMI above 25)
- Not exercising regularly
- Smoking
- Close family members having diabetes
- Ladies who have had gestational diabetes in a previous pregnancy
- Ladies who have polycystic ovarian syndrome
- Having Hypertension
- Having Hyperlipidemia
- Certain races: e.g. Arabs, Asians, African Americans, Latinos
- Pre-diabetes diagnosed by blood glucose measurement

# What are the Symptoms of Diabetes?

Symptoms of diabetes may include



Fatigue



Frequent urination in large amounts



Unusual thirst



Constant hunger



Frequent bladder, vaginal or gum infections



Slow healing of sores or wounds



Unexplained weight loss



Dry or itchy skin



Nausea



Blurred vision

In type 2 Diabetes, Symptoms can develop slowly, and may go unnoticed until diabetes causes damage. The only way to detect diabetes is by regular blood sugar screening.

## Blood Glucose Values:

	HbA1c	Fasting Glucose	Random/2 hr post OGTT
Normal	Less than 5.7 %	Less 100 mg/dl	Less than 140 mg/dl
At risk	5.7 - 6.4 %	100 - 125 mg/dl	140-199 mg/dl
Diabetes	6.5 % and above	126 and above	200 and above

In presence in symptoms, one abnormal value is enough for diagnosis, otherwise you need to repeat the test in a different day.

\*Divide by 18 to get the values in mmol

\*fasting is defined by not eating or drinking (except water) for at least 8 hours

# What are the complications of Diabetes?

Uncontrolled diabetes can lead to early death and serious health problems in different body organs. You can avoid these complications by self-monitoring of blood glucose and following your medical plan

Diabetes complications include:

**Vision problems:**  
cataract, glaucoma  
blindness

Vision  
problems

Diseases

**Diseases:**  
of Skin, joints,  
teeth and gum  
diseases

**Atherosclerosis:**  
heart attacks and  
strokes

Atherosclerosis

immune  
disease

**Other auto  
immune disease:**  
can appear in  
**type 1 diabetes**,  
such as thyroid  
disease, celiac  
disease, psoriasis,  
alopecia

**Kidney:**  
renal failure

Kidney

Impotence

**Nerves:**  
abnormal  
sensation and  
pain

Nerves

**Diabetic foot:**  
Ulceration,  
gangrene and  
amputation

Diabetic  
foot

Dyslipidemi

**Dyslipidemia:**  
high blood fats

Diabetes during pregnancy (Gestational Diabetes)  
can lead to birth defects and complication to the baby

# How Can Diabetes be prevented or controlled?

You can do nothing to change your age, race or family history; but you can reduce risk of having diabetes or its complications if you are able to:

- **Maintain normal weight and BMI**
- **Become more active (exercise 30-60 minutes daily)**
- **Eat balanced and healthy diet and drink plenty of water**
- **Cope with stress and anxiety**
- **Avoid smoking**
- **Be compliant with your medications and your appointments**
- **Rotate insulin injection sites**
- **Self-monitor your blood glucose and discuss them with your doctor**
- **Control your blood pressure and blood lipids**
- **Brush and floss your teeth every day have regular dental check up**
- **Take care of your feet and examine them regularly**
- **Regular screening for diabetes complications**

**Talk to your doctor to help you lower your risk of diabetes**



**Yes I can  
control  
Diabetes**

# How is Diabetes Treated?

Diabetes is a chronic disease, but people with diabetes can still enjoy long, healthy lives. The main goal in diabetes management is to control blood glucose levels.

-Type 1 diabetes patients need to take insulin many times every day.

-Type 2 diabetes patients may or may not need to take oral medications, insulin or other injections.

## What are your Targets?

<b>HbA1c</b> (done every 3-4 months)	Less than <b>7%</b>	These targets may differ according to age, other medical condition, or other factors
Fasting / before meal glucose	<b>80 - 130 mg/dl</b> <b>(4.4 – 7.2) mmol/l</b>	
2-3 hours after meal glucose	less than <b>180 mg/dl</b> less than <b>(10) mmol/l</b>	

It is important to wear an identification bracelet or necklace that states you have diabetes. You should also carry a card stating your medications, and contact numbers of a family member and your doctor



# (Hypoglycemia)

## Low blood sugar

### What is hypoglycemia?

Hypoglycemia is low blood glucose that leads to the appearance of certain signs and symptoms. There is no universal cut off value to define hypoglycemia; however, signs and symptoms usually appear when blood glucose drops below **70 mg/dl or 4 mmol/l**.

### Causes of Hypoglycemia:

- Excessive dose of insulin or oral diabetes medications
- Not enough food intake
- Missing or delaying meals or snacks
- Strenuous exercise
- Vomiting and diarrhea

### Signs and Symptoms of Hypoglycemia:

May vary from person to person and from time to time



- Drowsiness
- Irritability/ Nervousness / Mood swings
- Extreme hunger
- Headache



- Sweating
- Blurred vision
- Palpitation
- Weakness/ fatigue



- Shaking / tremor
- Loss of consciousness
- Seizures / convulsions

- Family members, classmates or coworkers should be familiar with signs and symptoms of hypoglycemia in order to help to treat the patient
- If there are significant hypoglycemia signs and symptoms and it is not possible to do a blood test to confirm the low blood sugar, immediate action should be taken and treatment should not be delayed for sake of confirmation
- Refrain from driving if you have symptoms of hypoglycemia. You are advised to check your blood sugar regularly during long journeys

## Treatment of Simple Hypoglycemia

1. Check the blood glucose (BG) to confirm if possible

2. In presence of symptoms and signs, if BG is less than **70 mg/dl (4mmol/l)** and you are able to swallow:

Take **15 g** of fast acting carbohydrates: choose **ONE** option

- **4-5** glucose tabs
- **1/2 cup** of regular soft drink (not diet)
- **1/2 juice** box (or **100 ml**)
- **1 tablespoon** of honey, jam or sugar
- **3 sugar cubes** dissolved in a cup of water
- **3 dates**

3. Apply **15/15** rule:

Have **15**  
grams of fast  
carbohydrates



Wait **15**  
minutes



Check  
blood  
glucose



If less than  
**70** mg/dl  
repeat the  
rule again

4. If BG became **greater than 70 mg/dl (4 mmol/l)** but next planned meal or snack is more than one hour away, give the patient a small snack that include one carbohydrate (15 g) and one protein portions such as :

- **1/2** cheese or meat sandwich
- Small bowl cereal with **1/2** cup milk

## Treatment of Severe Hypoglycemia



1. If the patient develops severe hypoglycemia and is not able to swallow or he/she became unconscious, **DO NOT** give anything by mouth
2. Place the unconscious patient in recovery position (on their side, head on arm, top leg bent and pulled forward).
3. Administer Glucagon intramuscular injection as soon as possible. Glucagon is a hormone that counteracts effects of Insulin and raises the blood glucose. Then call the ambulance or take him to the emergency department.
4. Glucagon injection kit should be provided to family members, workmates or school nurse, and they should be trained on how to administer it if needed.

### Glucagon Injection Instructions



- Learn how to use glucagon from your treating medical team
- If the child is 25 kg or less give half of the syringe contents (0.5 ml). If the child is greater than 25 kg give all of syringe content
- Glucagon should be used immediately after mixing powder and solution
- Nausea and vomiting are common side effects
- Glucagon should not be used after the expiry date printed on the kit. Check regularly and replace as needed. Store it in the fridge but do not freeze

As soon as the person awakens and is able to swallow, he or she should be given extra carbohydrates that include a fast-acting source of sugar – such as a regular soda or fruit juice and a long acting sugar – such as crackers and cheese or a meat sandwich

# (Hyperglycemia)

## High Blood Sugar

### What is hyperglycemia?

It means high blood glucose. It is recommended to act specially if blood glucose is **more than 14 mmol/l (250 mg/dl)**

### Causes of hyperglycemia:

- Overeating of carbohydrates
- Missing a medication dose or inadequate amount of insulin
- Stress and anxiety
- Acute illness or infection
- Lack of physical activity or less than usual
- Periods of rapid growth during adolescence as growth hormone raises blood glucose, especially during sleep

### Signs and Symptoms of Hyperglycemia:



Nausea



Dry mouth and thirst



Frequent urination in large amounts



Sleepiness, weakness and fatigue



Blurred vision



Dry and itchy skin, occasional thrush

### Symptoms of Hyperglycemia with Ketoacidosis:

Ketone (Acetone) is an acidic substance that can build up in the blood because of insulin deficiency and then get excreted in the urine. This is associated with very high blood glucose and can lead to a diabetic coma if not treated. The symptoms of diabetic ketoacidosis include with the previously mentioned signs and symptoms in addition to the following:

1. Fast deep breathing.
2. Fruity odour (acetone smell) from the mouth when breathing.
3. Rapid loss of weight.
4. Abdominal pain (stomach ache) and vomiting.
5. Altered or loss of consciousness.

## What should be done?

Check your blood glucose (BG) and if you are on insulin check ketones as well.

### 1. If BG level is between 300- 250 mg/dl (17-14 mmol/L) and no ketones:

- Take your medications (insulin or oral diabetes tablets) if you didn't take them before.
- Drink plenty of water (no sweet drinks).
- Exercise for half an hour.
- Repeat the BG test after 2 hours.
- If BG is dropping then Repeat BG test every 2-4 hour.
- Consult your health care professional if the level did not improve further.

### 2. If your BG is more than 300 mg/dl or 17 mmol/L:

-Drink plenty of water.

-Do not exercise.



-If you are on insulin treatment and you have ketones in your blood or urine then take an extra dose of fast acting insulin as recommended by your treating doctor.

-Check your blood glucose every hour and ketones every 2 hours.

-Consult your health care professional or the nearest hospital if the levels are not improving.

## Ketone Action Guide



**Below 0.6 mmol/L**  
A normal blood ketone value.



**0.6 mmol – 1.5 mmol**  
A high level of ketones and could present a risk of ketoacidosis.  
It is advisable to contact your healthcare team for advice.



**Above 1.5 mmol**  
A dangerous level of ketones which will require immediate medical care.

# Diabetes During Illness

People with diabetes do not get ill any more often than others unless they have poor metabolic control, but they do require special care when ill, especially if they are vomiting.



Illness and fever may raise the blood sugar level. Patients on insulin should continue to take their insulin even if unable to eat. It may be necessary to change the amount of insulin on sick days

When a person with diabetes is sick, it is important to monitor blood sugar levels and blood or urine for ketones every 3-4 hours.



Presence of ketones in blood or urine means your body is starving and needs insulin.

Call the diabetes nurse or doctor or go to the emergency department if there are any of the following problems:

1. Unable to eat or drink for **more than 4 hours**.
2. Vomiting **3 times or more** during the day.
3. Blood sugar above **20 mmol/l (360 mg/dl)** and ketones are present, despite extra insulin.



If you are vomiting or your appetite is reduced; blood sugar levels may go down sometimes, and it may be necessary to reduce the amount of insulin.

Try and have something from the list every hour:



**3/4 cup of oral rehydration fluid**



**1 cup of soup**



**Plain biscuits (15 g carb)**



**1 slice of bread or toast.**



**1 cup of tea with 1 tablespoon of sugar or honey**



**1/2 cup of cooked pulses**



**4-5 glucose tablets**



**1/2 cup of ice cream**



**1/2 cup of juice or regular soft drink**

## Diabetes and Traveling

If you are traveling, you should always have an extra supply of insulin with you, stored in safe and appropriate manner. It is useful to have the following at home or with you when you travel.



Glucagon  
injection kit



Paracetamol (Adol,  
Tylenol, Panadol)



A thermometer



Pump  
consumables  
and glucose  
sensors



Equipment for  
testing blood  
sugar



Honey or a  
sugary drink  
such as juice or  
glucose tablets



Cold pack to  
keep the insulin  
cold



Small snacks



Ketones strips



The patient should not drive a car or vehicle if he/ she has the signs or symptoms of hypoglycemia and his/ her blood sugar should be checked frequently during long driving.



The accompanying family or friends should be aware of hypoglycemic symptoms and signs and how it should be treated.

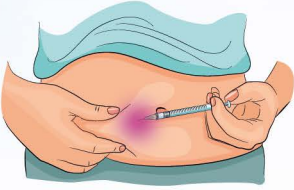


If the patient has symptoms or signs of hypoglycemia and the situation was not appropriate for checking the blood glucose, the patient should drink and eat what ever is available as soon as possible and should not wait and endanger his life.

Your adherence to  
regular check-ups  
and the dosage of the  
medicine will protect  
you from high  
or a sudden drop

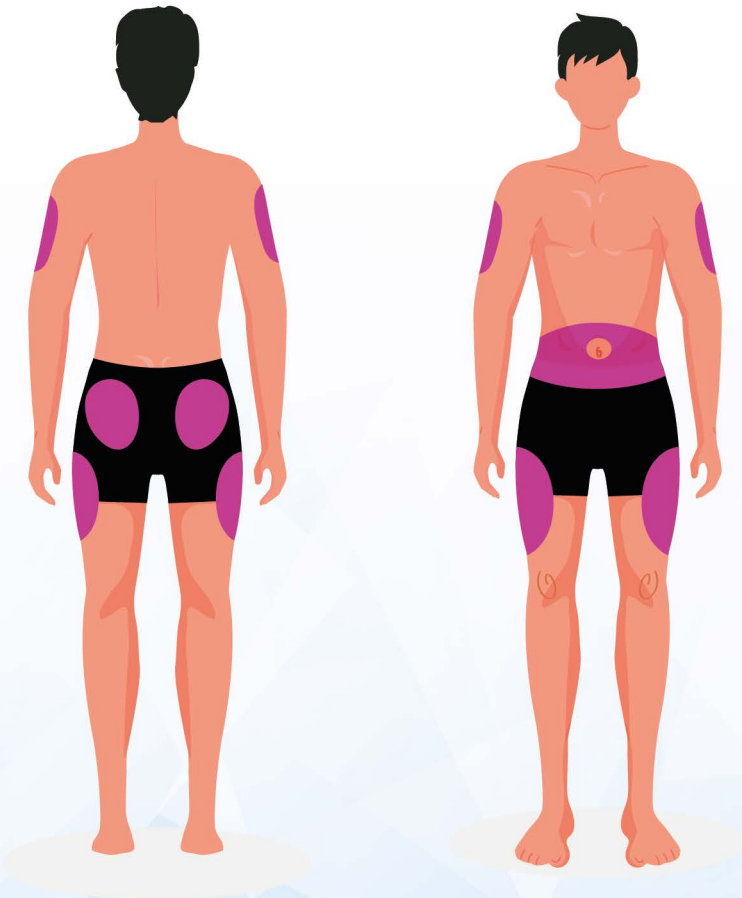


## Why is it important to rotate insulin injection sites?



•Because using the same spot over time can cause lipodystrophy (fatty lumps under the skin), that can interfere with insulin absorption and affect the blood glucose stability

•If lumps develop, DO NOT USE that site for at least 1-3 months or until lump goes away





# You own this moment. Diabetes doesn't.

The **OneTouch Select Plus Flex®** meter with **ColourSure™** technology instantly shows when your blood glucose numbers are in or out of range.

**Low**



**In Range**



**High**



Be sure to talk to your healthcare professional about the low and high limits that are right for you.

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