



STAY HEALTHY ONBOARD GUIDE

MARCH 2023

Diabetes

Symptoms, Risk Factors, Prevention and Diet



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Key Facts

- People with diabetes will rise to 643 million by 2030. (IDF, 2022)
- 1 in 2 adults living with diabetes are not yet diagnosed. (IDF, 2022)
- Diabetes is the main cause of blindness, kidney failure, heart attack, stroke, and lower limb amputation. (WHO, 2022)
- Diabetes treatment or prevention includes diet, physical activity, medication and regular screening and treatment for complications. (WHO, 2022)
- Male seafarers are of a greater risk of developing Type 2 Diabetes, compared to other occupations of the transport, rescue and security industries. (Herttua K. et al., 2022)

What is Diabetes?

Diabetes is defined as the chronic health condition where blood glucose is too elevated either due to the inability of the body to use insulin or pancreas cannot produce insulin.

Diabetes affects how human body turns food onto energy. When food is consumed, body breaks it down onto glucose and then releases it onto the bloodstream. As blood glucose increases, pancreas releases insulin to ensure that glucose is taken by the body cells to be used as energy.

There are three types of diabetes: Type 1 Diabetes (T1D), Type 2 Diabetes (T2D) and Gestational Diabetes.

T1D

- Pancreas cannot produce enough insulin.
- It is Insulin-dependent.
- Develops at any age (mostly at young age until young adulthood, before 40).

T2D

- Human cells cannot respond normally to insulin.
- It can be both insulin and non-insulin dependent.
- Develops usually after the age of 45.

Gestational Diabetes

- Occurs only at women during pregnancy without any diabetes history.
- Pancreas cannot produce enough insulin.
- Diagnosis is vital through blood test and oral glucose tolerance test (OGTT) during pregnancy.
- Gestational Diabetes may increase risk of high blood pressure (i.e., hypertension) during pregnancy or deliver a large size baby.

Risk Factors of T1D & T2D

T1D

- **Family History (a parent, brother, or sister with T1D)**
- **Age**
T1D usually develops in children, teens, and young adults.

T2D

- **Having pre-diabetes**
Blood sugar levels are increased but not yet diagnosed as diabetes.
- **Being overweight (BMI between 25 to 29.9kg/m²)**
 - BMI has a linear progression with diabetes risk, as BMI increases, diabetes risk increases.
(Klein S. et al., 2022)
 - People having obesity have 7 times greater risk of developing T2D compared to healthy weight people. (Mary G. et al., 2014)
- **Age (45 years or older)**
- **Family History (a parent, brother, or sister with T1D)**
- **Being physical inactive**
Physical activity less than 3 times a week

BMI calculation

$$\text{BMI} = \text{Body Weight (kg)} / \text{Height (m}^2\text{)}$$

BMI = less than 18.5 (underweight)

BMI = 18.5–24.9 (normal weight)

BMI = 25–29.9 (overweight)

BMI = higher or equal 30 (obesity)

Prediabetes

Prediabetes is the health condition where blood sugar is higher than normal (100–125mg/dL) but not yet diagnosed as diabetes.

Signs and Symptoms

There are not any clear signs or symptoms when having prediabetes.

Risk Factors

- Being overweight
- Age (45 years or older)
- Family history (a parent, brother, or sister with T2D)
- Being physical inactive
- History of previous pregnancy in females with gestational diabetes
- Females having Polycystic Ovary Syndrome (PCOS)



GLUCOSE LEVELS CHART

What are the common symptoms?

T1D

- Increased thirst
- Frequent urination (especially during the night)
- Feeling tired
- Unexpected weight and muscle mass loss
- Persistent infections such as thrush

Symptoms appear in a few hours or days in young people and in a few days or weeks in adults.

T2D

- Increased thirst
- Frequent urination (especially during the night)
- Feeling tired
- Unexpected weight loss
- Persistent infections such as thrush
- Longer healing of cuts and wounds
- Blurred vision

Symptoms appear over several years and may not be visible.

DIABETES SYMPTOMS



THIRST



WEAKNESS



DIZZINESS



BLURRY VISION



CONFUSION



TINGLING HANDS
OR FEET



WEIGHT LOSS



ALWAYS HUNGRY



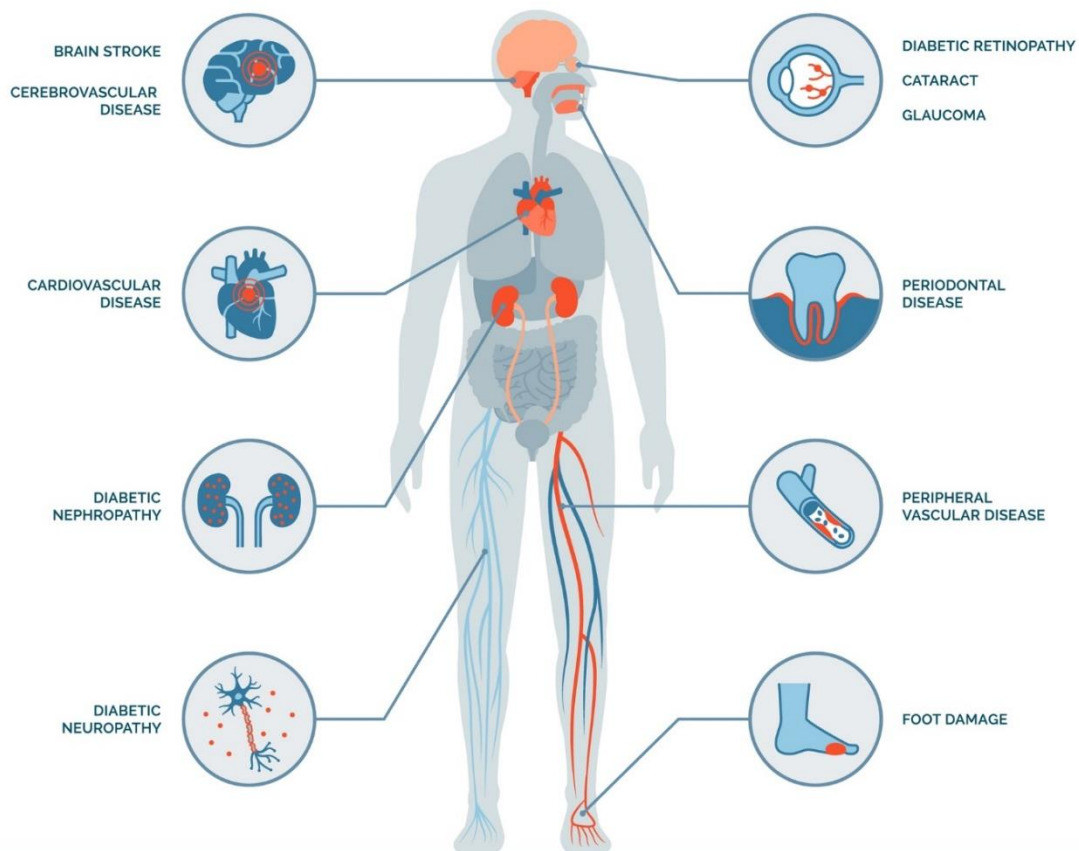
FREQUENT URINATION



WOUNDS THAT
WON'T HEAL

What are the complications?

Diabetes complications may be chronic or acute. Chronic complications can happen over years or decades, while acute complications can happen quickly.



Chronic Complications

- **Retinopathy**
Eye disease caused by diabetes which affects the eyesight.
- **Foot problems**
Diabetes can cause nerve damage which in turn affects the feeling of foot. Additionally, high blood glucose makes sore and cuts healing process, slower. If these problems are not treated properly, the result might be foot amputation.
- **Heart attack and/or stroke**
Blood vessels can be damaged due to diabetes, leading to heart attack and/or stroke.
- **Nephropathy**
Kidneys filtrate the blood and remove toxins and waste from the body. Over time, diabetes may affect kidneys' function, causing nephropathy (kidney problems).

- **Neuropathy**

Diabetes may affect nerves resulting in altering senses (sight, hearing, feel, moves).

- **Gum disease**

People with diabetes have higher glucose in their saliva. As a result, bacteria are attracted causing gums damages.

- **Other health conditions**

Diabetes can increase risk of other health conditions such as cancer.

Acute Complications

- **Hyperosmolar Hyperglycaemic State (HSS)**

It is a life-threatening health condition in people with T2D caused by severe dehydration and extremely high blood glucose (equal or higher than 720mg/dL).

- **Diabetic Ketoacidosis (DKA)**

It is a life-threatening health condition usually occurring in people with T1D due to the lack of insulin and the high blood sugar.

- **Hyperglycaemia**

The health condition where blood glucose is too high, usually higher than 126mg/dL before a meal and higher than 153mg/dL two hours after a meal.

- **Hypoglycaemia**

The health condition where blood glucose is equal or lower than 70mg/dL with symptoms of tachycardia, shaking, sweating, anxiety, dizziness, confusion, and increased hunger.

Steps for Managing Prevention

1. Maintain a healthy body weight!

A Diabetes Prevention Program by the National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK), examined the appropriate prevention approach for T2D. The results indicated that a weight loss of 7% at people of high T2D risk (older than 60 years, people with family history of diabetes, women with history of gestational diabetes) resulted in 34% delay in diabetes onset, after 10 years.

Additionally, a weight loss of 10kg can lead to remission in people already having T2D. Remission of diabetes is defined as the state where blood glucose remains at a normal range for at least 6 months, without taking any medications.

2. Exercise!

Being active, helps body to become more sensitive to insulin that in turn helps diabetes control.

WHO recommends for healthy adults and adults having T2D:

- Limiting sedentary time
- Moderate-intensity aerobic physical activity of at least 150–300 minutes,
- Vigorous-intensity aerobic physical activity 75–150 minutes or combination of both, during the week. Additionally, 2 or more days of muscle-strengthening activities during the week.

3. Modify your diet!

Some simple alterations in diet will help with the prevention or remission of diabetes:

- Prefer whole grain rather than refined grains, when possible.
Whole grain products such as brown rice or brown bread contain the bran and fibre, which slower blood glucose and insulin increase in the blood.
- Limit sugar intake as possible.
Be aware that fruits contain fructose, the natural sugar which still increases blood glucose, if consumed in large portions. Hence, fruit portions should not be consumed all at once.
- Choose healthy fats such as the polyunsaturated fats in nuts, seeds, avocado and fish oils.
- Eating unsaturated fats, lowers blood glucose levels and improves insulin resistance.
(Mozaffarian D. & Imamura F., 2016)

- Limit red (beef, pork, lamb) and processed meat (deli meats, sausages) as much as possible, as it contains saturated fat. Saturated fat does not directly increase blood sugar. However, most people with diabetes have insulin resistance. Insulin resistance is the condition where human body requires higher insulin to control high blood glucose. At some point, body cells stop responding to insulin, pancreas keeps making more insulin trying to get the cells to respond, and eventually cells become insulin resistant, while blood glucose increases. Saturated fat contributes to high insulin resistance.

4. Avoid tobacco smoking!

Tobacco users have a 30 to 40% higher risk developing T2D compared to non-smokers (CDC). Nicotine, rises blood sugar, making it harder to control glucose levels.

5. Limit alcohol consumption!

Alcohol recommendations are up to 2 drinks per day for men and up to 1 drink per day for women. Heavy drinking (15 or more drinks for men and 8 drinks or more for women per week), may cause ketoacidosis and hypertriglyceridemia, two of the most serious acute diabetes complications.

6. Manage stress!

Evidence suggest that stress can increase T2D risk. (Wong H. et al., 2019) High level of stress hormones may affect pancreas cells that produce insulin and thus reduce insulin production.



Grains and Diabetes

Grains is the key food group for blood glucose control.

A simple way to identify foods that affect most the blood glucose levels, is Glycaemic Index.

Glycaemic Index

Glycaemic index (GI) is a number that indicates how quickly and how high 50g of a specific food, increases blood glucose levels. Low GI foods, release glucose slowly and steadily whilst high GI foods, release glucose rapidly.

Low GI food = 1–55
Medium GI food = 56–69
High GI food = 70 or higher

Factors that affect GI:

The GI of a food, is affected by several factors:

- **Food Maturity Index**

A brown ripen banana will increase blood glucose more, compared to a green unripen banana.

- **Fibre content**

Whole grain pasta, with higher fibre content, will cause a mild increase in blood glucose levels post meal, while white pasta will increase blood glucose more.

- **Cooking time**

Pasta cooked al dente, will slightly increase blood glucose post meal, while pasta well cooked will increase blood glucose more.

- **Food combinations and Portions**

If a meal is well balanced with appropriate portions of whole grains, healthy protein and fats, will slightly increase blood glucose post meal, compared to an unbalanced meal with higher fat content, especially unhealthy fats, such as pizza or fried chicken. Food combinations and portions are indicated on **Figure 1**.

Below table, indicates the GI values of certain foods that might be available on-board.

| FOOD | GI |
|---|-------|
| BREAD | |
| WHITE BREAD | 73-77 |
| WHOLE WHEAT BREAD | 72-76 |
| KAISER ROLLS | 73 |
| RICE | |
| BOILED WHITE RICE | 69-77 |
| BOILED BROWN RICE | 64-72 |
| RICE PILAF | 60 |
| RED RICE | 55 |
| PASTA/NOODLES | |
| MACARONI | 47 |
| SPAETZLE | 60 |
| RICE NOODLES | 46-60 |
| UDON NOODLES | 48-62 |
| POTATO | |
| POTATO GNOCCHI | 70 |
| BOILED POTATO | 74-82 |
| BOILED POTATO WITH SKIN (FOR EG., DILL POTATO) | 56-59 |
| POTATO MASH | 84-90 |
| FRIED POTATOES | 58-68 |
| BREAKFAST CEREALS | |
| CORNFLAKES | 75-87 |
| PORRIDGE (ROLLED OATS) | 53-57 |
| MILLET PORRIDGE | 62-72 |
| FRUITS | |
| APPLE | 34-38 |
| ORANGE | 40-46 |
| BANANA | 48-54 |
| PINEAPPLE | 51-67 |
| MANGO | 46-56 |
| WATERMELON | 72-80 |
| SNACKS | |
| CHOCOLATE | 37-43 |
| BISCUITS | 70 |

| | |
|-------------|-------|
| SOFT DRINKS | 56-62 |
| OTHER | |
| COUSCOUS | 61-69 |
| BUCKWHEAT | 27-43 |
| BARLEY | 26-30 |
| POLENTA | 68 |

If having diabetes or high blood glucose, prefer low GI foods when possible. If a low GI food is not an option, prefer medium or high GI food but in lower portions than usual. High GI foods, are best to be avoided if having diabetes.

Red rice and macaroni, are two of the high-carbohydrate foods that are of low to medium GI, and is best to be preferred, if there are available.

Key Factors to Remember!

1) Food portion sizes

Even if a food has higher fibre content than others, portion size will determine how much blood glucose increases. For instance, eating 10 apples at once, even if they are healthy, will increase blood glucose more.

Refer to the Health & Wellbeing Guide for more information on portion sizes.

2) GI of the food plays a crucial role!

3) Well-balanced meals are the key.

4) Prefer healthy cooking methods such as boiling, grilling and baking.

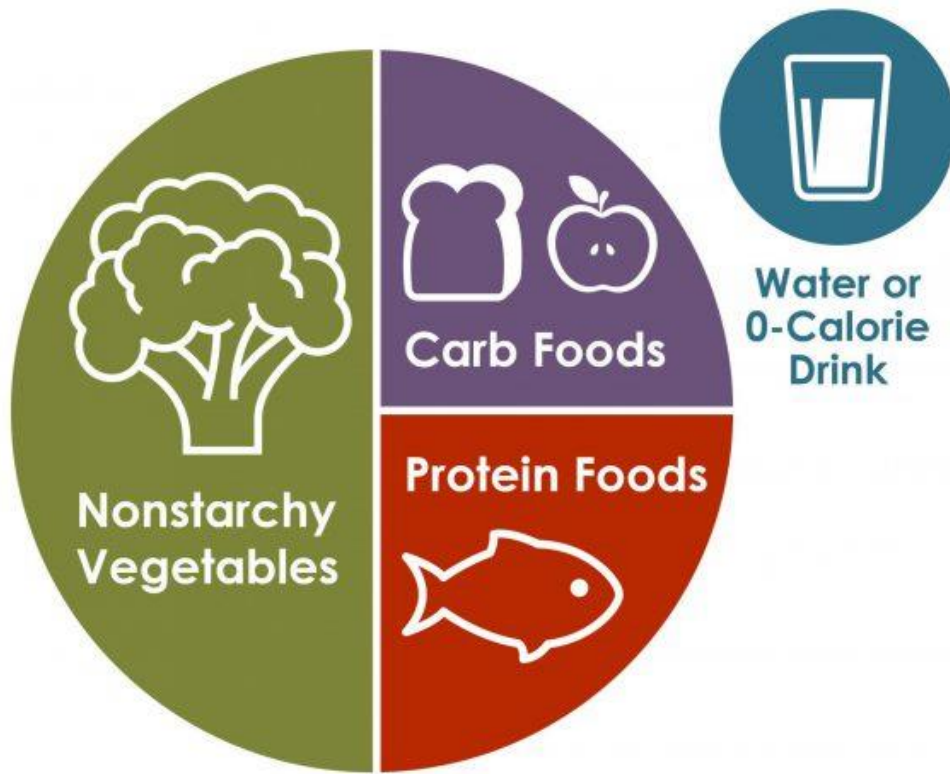


Figure 1. The Diabetes Plate Method: a way to create a well-balanced meal without the need to measure.

Oceanic's Suggestions:

- ✓ Avoid smoking!
- ✓ Maintain a healthy body weight!
- ✓ Keep an eye on grain foods!
- ✓ Manage stress!
- ✓ Exercise!
- ✓ Follow a healthy and well-balanced diet!

Diabetes-Friendly Recipe

Oven roasted chicken with red rice and grilled vegetables

Oven roasted chicken:

Ingredients (10 servings):

1.8kg chicken breast

5g sweet paprika

20ml olive oil

100g chopped garlic

10g salt

A dash of ground black pepper

5g dry oregano

5g dry basil



Method:

1. Combine all the ingredients and marinade the chicken.
2. Bake the chicken until ready.

Minimum internal cooking temperature for poultry: 165°F (74°C) for 15 seconds.

Red rice:

Ingredients (10 servings):

1kg red rice

Method:

1. Wash the rice and soak it at least 30 minutes in water.
2. Boil or steam the rice for approximately 20 minutes or until ready.

Note: The amount of water to be added might vary between different rice types, but usually is 2:1.



Grilled vegetables:

Ingredients (10 servings):

200g sliced green bell peppers

200g sliced red onions

200g sliced eggplants

200g sliced zucchini

10g oregano

A dash of salt

A dash of ground black pepper



Method:

1. Marinate all the sliced vegetables with oregano, salt, and pepper.
2. Grill from both sides.

Nutritional comments:

This recipe is healthy and well-balanced as it combines food from 3 main food groups (protein, carbohydrates, vegetables). Red rice, as mentioned above, is of low to medium GI, thus it is a great choice for people with diabetes or high glucose levels.

If a certain food is not available at your vessel, you might order.



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