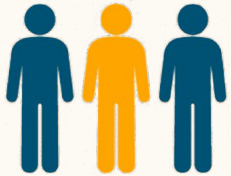
BE AWARE

About Diabetes

What is diabetes?

Diabetes is a condition where your body cannot manage sugar properly, resulting in too much sugar in your blood.

Diabetes is a common and serious condition in Singapore!



1 in 3
Singaporeans is at risk of developing diabetes

Close to 1 in 10
Singaporeans has diabetes

2 in 3
individuals with newly diagnosed kidney failure have diabetes

1 in 3
individuals diagnosed with diabetes continues to have high blood sugar levels

1 in 3
individuals with diabetes does not know he or she has it

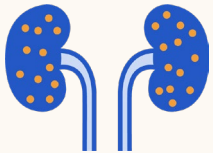
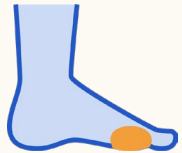
1 in 3
individuals with diabetes has eye disease

Every day,
about **4** individuals with diabetes **undergo amputations due to complications**

Diabetes can cause complications for your body

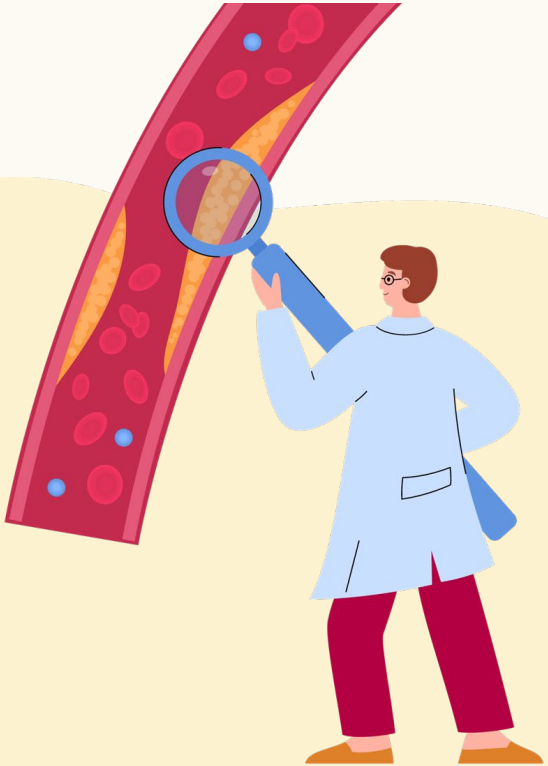
High blood sugar | **High blood pressure** | **High blood cholesterol**

Blood vessel damage

Brain	Eyes	Teeth	Heart	Kidneys	Feet
					
Stroke	Blindness	Tooth decay, gum disease	Heart attack	Kidney failure	Ulcer, Amputation

Diabetes can cause complications for your body

- High blood sugar, high blood pressure and high blood cholesterol will **damage blood vessels**
- **You may not know of the damage** until you screen for these complications



Small blood vessel (microvascular) damage

- Nerve damage (neuropathy)
  - ↳ Loss of feeling in the feet
  - ↳ Increased risk of foot ulcers and infections
- Eye disease (retinopathy)
- Reduced kidney function (nephropathy)

Large blood vessel (macrovascular) damage

- Stroke (cerebrovascular disease)
- Heart disease (cardiovascular disease)
- Circulatory problems (peripheral vascular disease)

Types of diabetes mellitus

Type 1 diabetes

- This occurs when the **pancreas does not produce enough insulin** for normal body function.
- This may be due to an **autoimmune condition** whereby the body's immune system attacks and destroys the beta cells of the pancreas, making it unable to produce insulin.
- Not caused by diet and lifestyle.
- While it typically develops in children or early adulthood, it can also happen to people of other ages.

Type 2 diabetes

- Most common form of diabetes.
- Usually occurs when the **body's cells do not respond well or are resistant to the body's own insulin.**
- Commonly associated **with being overweight** and having **excessive body fat** (under the skin and around the internal organs).
- Typically develops in older adults (risk increases for those above 40 years).

Gestational diabetes

- Some women develop higher blood sugar levels **during pregnancy**, which usually normalise after delivery.
- Increased risk of developing diabetes later on in life.
- Visit https://go.gov.sg/parenthub-gdm-p5 to find out more about Gestational Diabetes.

Symptoms

It can be difficult to distinguish Type 1 from Type 2 diabetes.
They share many similar symptoms, and the differences are slight.

Symptoms that may be common to both*

- Need to urinate often (especially at night)
- Feels thirsty often
- Losing weight without trying
- Often hungry
- Blurred vision
- Numbness or tingling in hands/feet
- Gets tired easily, or lacks energy
- Dry skin
- Sores/wounds that take a long time to heal
- Prone to infections (commonly involving skin, urine or lungs)

*May not be experienced by all

How Type 1 and Type 2 diabetes present

Type 1 diabetes

Fast onset, often over a few days.
When symptoms are ignored, it can lead to serious complications such as Diabetic Ketoacidosis (DKA), when acids known as ketones build up in the bloodstream.

Type 2 diabetes

May not have obvious symptoms or **the symptoms can be easily missed.** If ignored, they can lead to serious complications such as Hyperosmolar Hyperglycaemic Syndrome (HHS), when blood sugar is dangerously high and the body becomes severely dehydrated.

What is pre-diabetes?

- Pre-diabetes is when your blood sugar levels are **higher than normal but not high enough to be diagnosed with diabetes.**
- Having pre-diabetes puts you at an **increased risk of Type 2 diabetes.**
- Making lifestyle changes, such as healthy eating, **can delay the progression to diabetes or reverse pre-diabetes.**
- People with pre-diabetes usually have no symptoms. **The only way to diagnose if you have pre-diabetes is through blood tests.**

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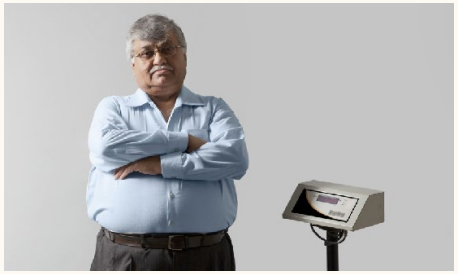
How Diabetes Develops

Risk factors for developing pre-diabetes and Type 2 diabetes

Family member(s)
known to have diabetes

History of diabetes
during pregnancy

40 years of age and above



Body Mass Index (BMI) of 23.0 kg/m² or higher

Inactive (sedentary) lifestyle

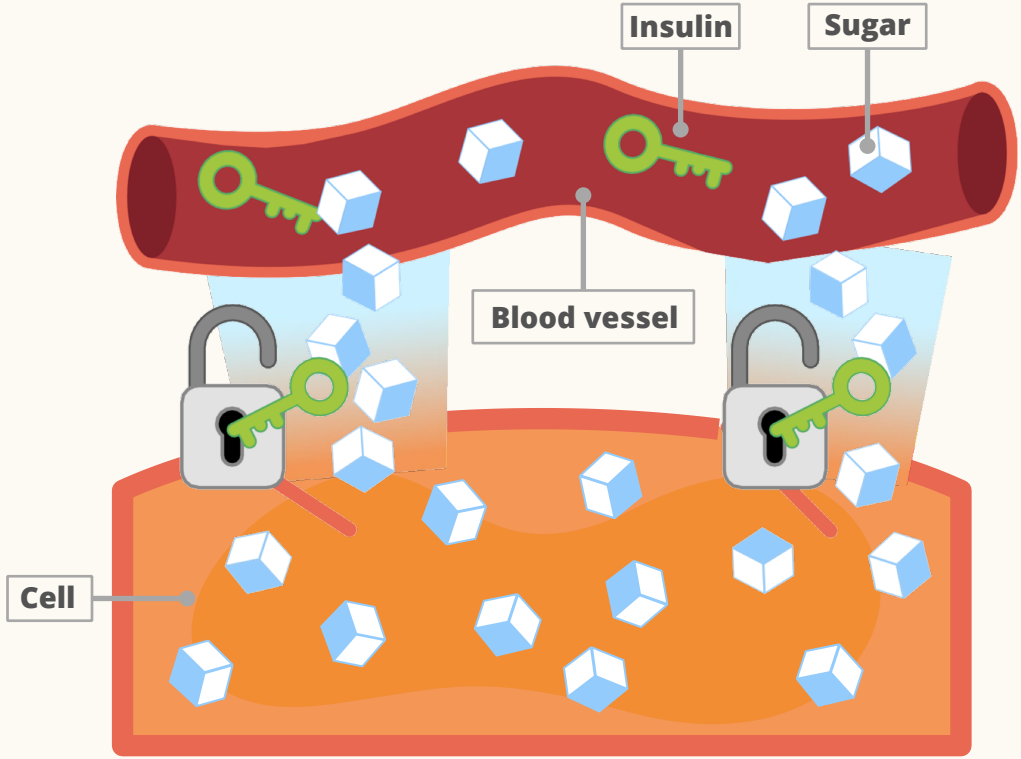
Unhealthy eating habits

How insulin works in a healthy person

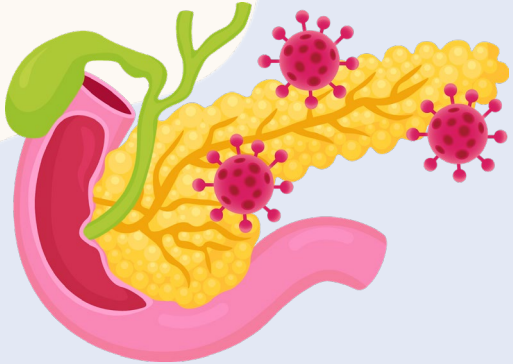
Insulin is a hormone that helps control the blood sugar level in your body.

It is produced by beta cells in one of our organs called the pancreas (insulin factory).

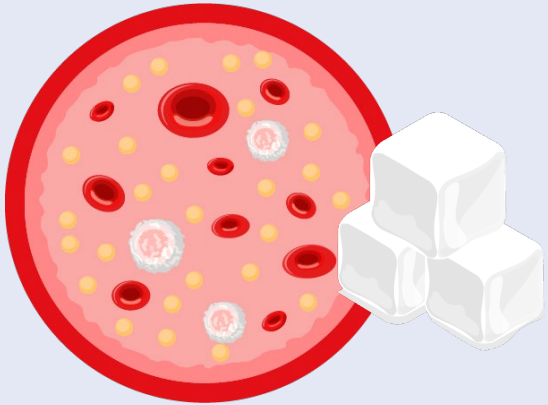
Insulin moves sugar (glucose) into the cells, which is then used to **generate energy** and maintain normal body functions.



How Type 1 diabetes develops

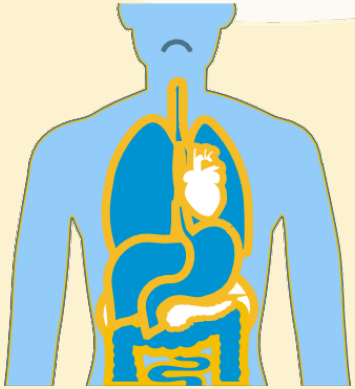


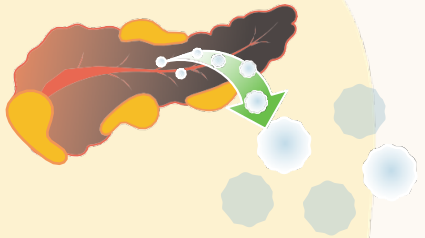
- Body's immune system **destroys the insulin-producing beta cells of the pancreas** (insulin factory). The body is **unable to produce sufficient insulin.**



- Without insulin, the body is unable to move glucose from the bloodstream into the body cells to use for energy. **As a result, blood sugar levels remain high.**

How Type 2 diabetes develops

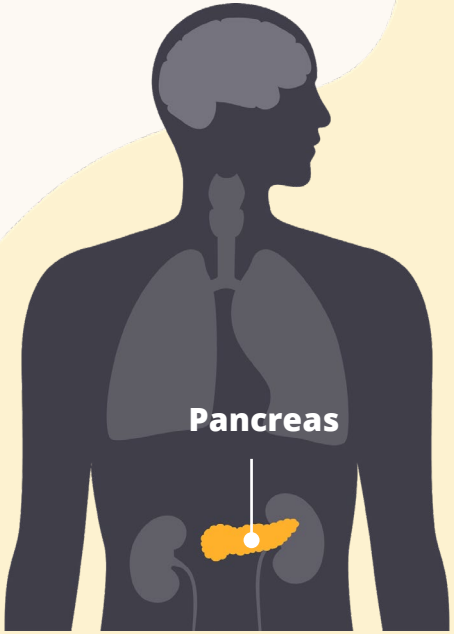


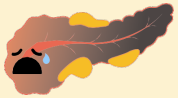


- **Frequent intake of sugar and refined carbohydrates** causes blood sugar levels to rise, forcing the pancreas (insulin factory) to work harder to produce more insulin to control blood sugar levels.
- **As the body does not require this excess sugar for energy, it is converted and stored as fat.** If there is excess fat in the body, the body cells do not respond well to insulin. **More insulin is needed to move sugar from the bloodstream into body cells, further stressing the pancreas.**
- Over time, **the overworked pancreas becomes damaged and produces less insulin,** making it harder to keep blood sugar levels normal.

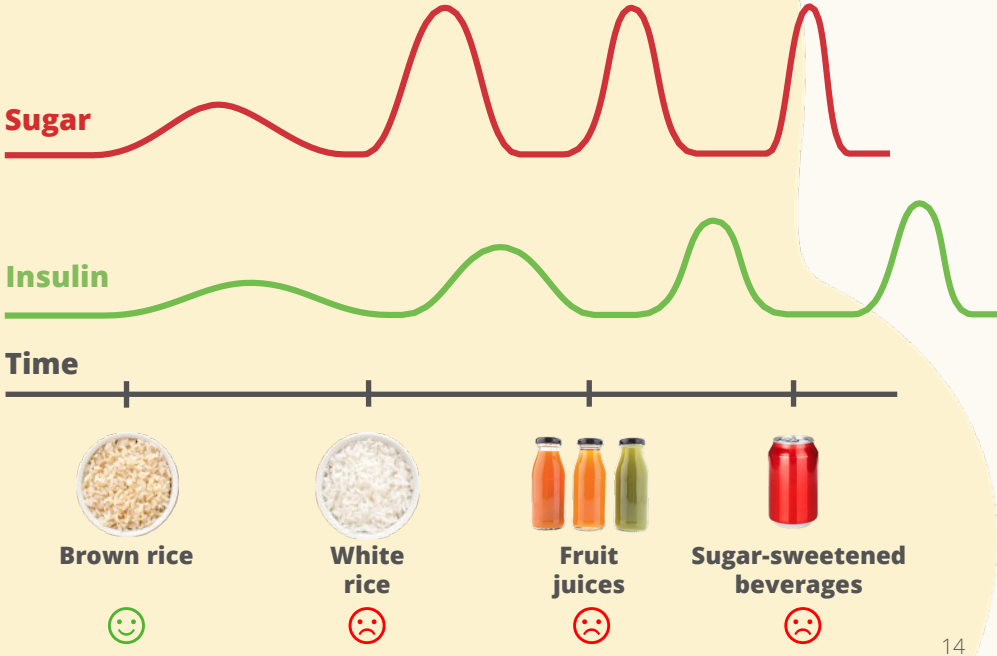
High blood sugar levels cause your pancreas (insulin factory) to work harder

Eating food high in sugar causes blood sugar levels to rise,
forcing the pancreas to produce more insulin to control blood sugar level.

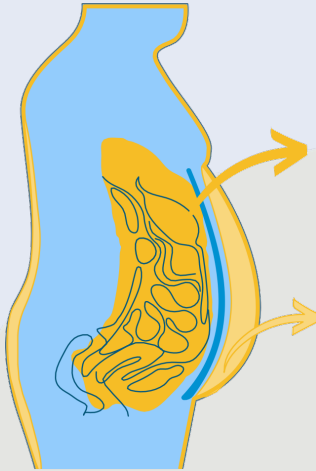




Overworked pancreas



Excess (unused) sugar in your body is stored as fat

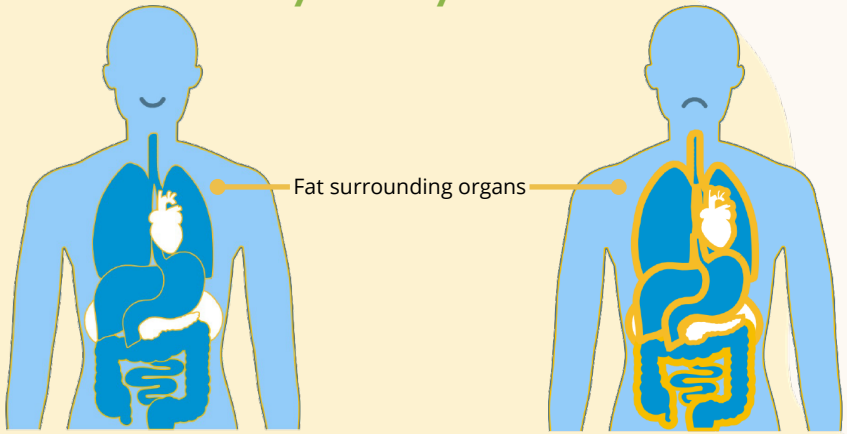


Where is the fat stored?

Fat surrounding the organs and muscles (this is not visible to us)

Fat under the skin (this is visible to us)

There may be excess fat in your body even if you look thin



Healthy
Less internal fat

TOFI (Thin Outside, Fat Inside)
More internal fat even though the person appears to have less fat under the skin. **If you are TOFI, you are also at risk of diabetes.**

*You are likely to have excess internal fat if you have **an apple-shaped body**.*

Excess internal fat can cause problems

Internal fat

Fat surrounding internal organs, and those which enters organs and muscles, can lead to inflammation and damage of body cells.

Consequences of excess fat in the body

- Insulin resistance, high blood pressure, high LDL-cholesterol, low HDL-cholesterol and high triglycerides.
- Excess internal fat can cause damage to the pancreas and other organs.

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What can I do to manage diabetes?

Myths and Facts

Myths	Facts
Individuals with diabetes should **never consume sugar**	With good diabetes control and knowing your personal requirements, **you may be able to include some sugars into your daily eating plan.**
Individuals with diabetes **cannot exercise**	**You can safely exercise as long as you can keep a close watch on your blood sugar levels.** If you are on insulin and oral tablets like sulphonylureas, adjust your dose if necessary, and pack some snacks to consume in the event of hypoglycaemia (low blood sugar).
Individuals with diabetes can be **cured by taking insulin**	**Taking insulin helps you manage the condition, but it will not make the disease go away.**

What can you do?

For both Type 1 and Type 2 diabetes

- Know your targets for glucose control and weight
- Follow a healthy diet plan
- Exercise regularly
- Take your prescribed medications in a timely and regular manner
- Prioritise your emotional and mental well-being

For Type 1 diabetes and Type 2 diabetes requiring insulin treatment

- Take insulin **injections** as prescribed by your doctor
- Monitor blood sugar as advised by your healthcare team

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Tips for those with Type 1 diabetes

Carbohydrate counting

When you have Type 1 diabetes, you need to give yourself insulin doses that correspond to the amount of carbohydrates you consume.

Carbohydrate counting helps you adjust your insulin doses based on the amount of food and drinks you consume.

What are carbohydrates?

Carbohydrates are a type of nutrient found in foods and drinks

When your body digests food and drinks that contain carbohydrates, they are broken down into glucose, which is your body's preferred source of energy.

Link between carbohydrates and insulin

When you consume big amounts of carbohydrates, your blood sugar level will be high and a greater amount of insulin is required to bring your glucose level back down to normal level.

Speak to your care team on a treatment plan personalised to your needs.

Know what to do when you fall sick

- Seek medical attention immediately if you cannot eat/ drink/ take your medication or insulin, or if you are feeling increasingly drowsy or confused.
- Keep eating or drinking. If you have difficulty taking normal meals, take snacks or drinks in small frequent portions throughout the day.
- If you are experiencing low glucose levels (below 4 mmol/L or your target range), follow the 15-15 rule: take 15g of fast-acting sugars, re-check in 15 minutes and repeat if still low.

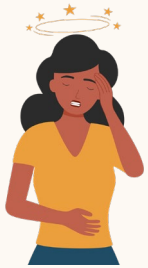
Know what to do when you fall sick

Learn the signs of diabetic ketoacidosis (DKA):

High blood sugar

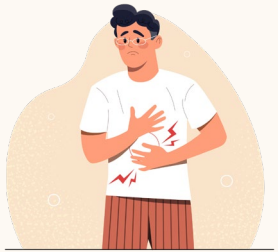
Thirst

Frequent urination



Drowsiness

Nausea or vomiting



Abdominal pain

Difficulty breathing

Fruity odour breath

Confusion

If you are experiencing any symptoms of DKA,
please seek medical attention immediately as this is an emergency.

Know what to do when you fall sick

- If your blood sugar level readings are over 16 mmol/L more than two times in a row, it is a sign that you should seek medical attention fast for further investigation (e.g., checking ketone levels in the blood) unless you have been otherwise advised by the main doctor looking after your diabetes. High ketones could mean DKA which is a medical emergency.

- Be sure to speak to your healthcare team to learn what you should do. A plan would include: when to seek medical attention, how often to check your blood sugar level, what foods and fluids to take during your illness, how to adjust your insulin or oral medication if you need to, if and when you need to check for ketones.

Coping tips for Type 1 diabetes

- **You can live a normal full life and manage your diabetes well.**
- You will be expected to make some adjustments, changes and take medications.
- Discuss with your healthcare team to develop an individualised treatment plan that works for you.
- Be prepared to **learn day-to-day living with diabetes skills** such as making decisions about types and amount of food, insulin doses, glucose monitoring, engaging in exercise, how to respond to different glucose levels and what to do when you feel unwell (**Sick Day Advice** – discuss this with your healthcare team).

Coping tips for Type 1 diabetes

- **Do not change, discontinue or stop any medication, treatment or therapy** without first speaking to your healthcare professional.
- It is important that you do not miss your appointments, blood and urine checks or diabetes-related complications screening.
- It is important where possible to involve your family, friends, colleagues and others in your care, especially when you are facing different stages in your life such as a new job, planning to start a family etc.
- You may wish to consider help with the emotional, psychological and social aspects of having diabetes.
- Expect that it may be necessary for changes to be made along the way.

Where can you seek help?

For more in-depth information on Type 1 diabetes, please speak to an endocrinologist/healthcare professionals or reach out to support groups. You may also refer to the links below for resources:

typeOne.sg Facebook Group
https://www.facebook.com/groups/317249489081585/about/

AIC Care Services
https://www.aic.sg/care-services

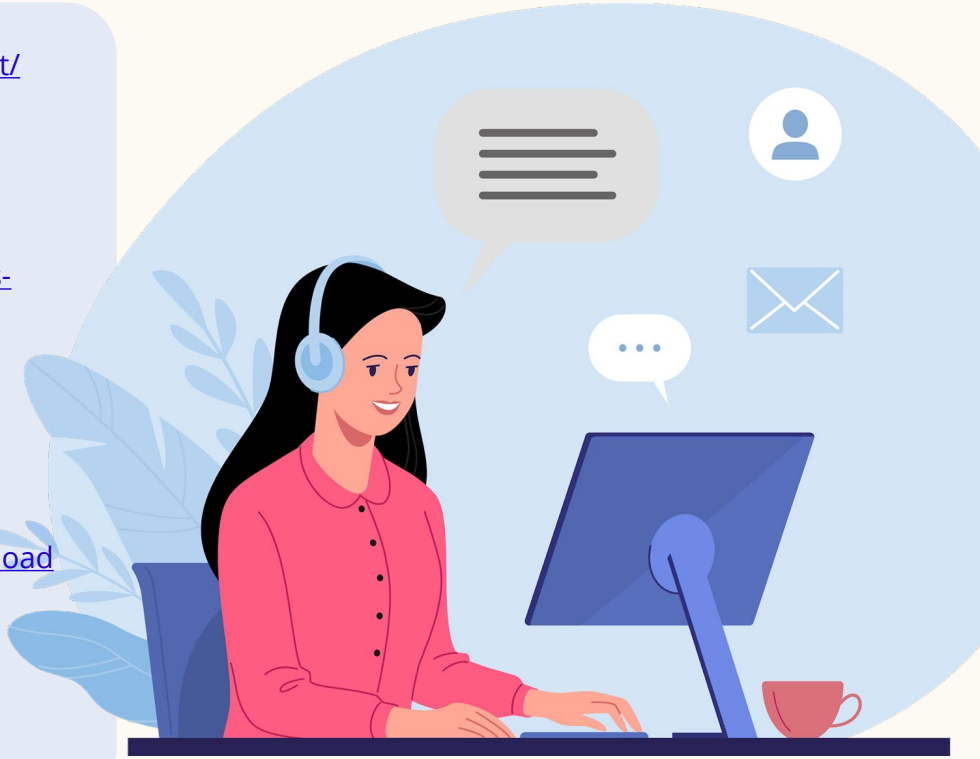
MOH Healthcare Schemes & Subsidies
https://www.moh.gov.sg/cost-financing/healthcare-schemes-subsidies

MOH Search for Healthcare Professionals
https://www.moh.gov.sg/hpp/all-healthcare-professionals/healthcare-professionals-search

Listing of Licensed Healthcare Institutions
https://www.hcidirectory.gov.sg/hcidirectory/clinic.do?task=load

National Council of Social Service
https://www.ncss.gov.sg/social-services/caregivers

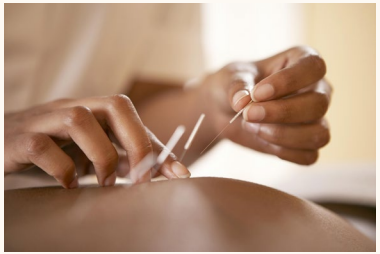
National Care Hotline
1800-202-6868



BE AWARE

Traditional and Complementary Medicine

Traditional & Complementary Medicine (T&CM)



Traditional Chinese Medicine and acupuncture

Traditional medicines like Ayurveda

Herbal medicines and supplements

Traditional and complementary medicine (T&CM) aims to supplement general health and is not an alternative treatment for diabetes. The concurrent use of T&CM with diabetic treatments may not be suitable for all. Improper T&CM use has caused harm like burns from moxibustion. Such risks are greater in individuals who have complications arising from diabetes e.g., decreased feeling or sensation due to neuropathy, or kidney failure. Please speak to your doctor before starting any T&CM treatment.

Traditional & Complementary Medicine (T&CM)

Before I consider starting on T&CM

Continue with Western medicine unless otherwise advised by your doctor

Seek **advice from a T&CM practitioner** before taking herbal medicines or supplements

Continue to **monitor your blood sugar** as advised

What I need to know about T&CM

In Singapore, Traditional Medicine (TM) typically refers to Traditional Chinese Medicine (TCM), Traditional Malay Medicine (TMM), Traditional Indian Medicine (TIM), while Complementary Medicine (CM) refers to all other forms of medicine that are non–mainstream, e.g., chiropractic, osteopathy, aromatherapy, etc.

Scientific studies on effectiveness of T&CM for diabetes and its complications are inconclusive or insufficient.