

# Fundamentals in Insulin Therapy for Type 2 Diabetes (FITT2)



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## GLOSSARY

It is recommended that you familiarise yourself with all the terms in this glossary (in alphabetical order) as these terms will be used throughout this guidebook.

<b>Apidra®</b>	Insulin glulisine, a rapid-acting insulin for bolus coverage
<b>Basal Insulin</b>	Background insulin coverage to control blood glucose throughout the day and night, even when fasting. This usually refers to intermediate- or long-acting insulin
<b>BG</b>	Blood glucose or blood sugar
<b>Bolus Insulin</b>	Refers to short- or rapid-acting insulin to cover mealtime glucose rise from carbohydrate consumption (meal bolus) and to correct for high BG levels (correction bolus)
<b>Carbohydrate (carb) counting</b>	Carbohydrates which include sugars and starches, are one of the main nutrients found in food and drinks. Carbs affect your BG more than other nutrients and is usually counted in grams (g) or by carb portions
<b>Diabetes Mellitus (diabetes / DM)</b>	A metabolic disease that is characterised by either decreased insulin sensitivity or the inability of the pancreas to produce insulin, causing high BG
<b>DKA</b>	Diabetic ketoacidosis: A serious complication of DM that occurs when the body produces high levels of blood acids called ketones. This usually occurs when BG has been too high for too long and is life-threatening
<b>HbA1c</b>	Glycated haemoglobin, the average BG level over a 2-3 month period
<b>Hyperglycaemia</b>	High BG
<b>Hypoglycaemia (Hypo)</b>	Low BG of less than 4.0 mmol/L
<b>Insulatard®</b>	Isophane insulin, an intermediate-acting insulin for basal coverage
<b>Lantus®</b>	Insulin glargine, a long-acting insulin for basal coverage
<b>Levemir®</b>	Insulin detemir, a long-acting insulin for basal coverage



## Lipodystrophy

Small lump or dent in the skin that forms when a person repeatedly injects insulin into the same spot and / or with insulin needle re-use

## MDI

Multiple daily insulin injections – these are insulin injections taken several times a day and includes 2 different types of insulin (long-acting or basal insulin and rapid-acting or bolus insulin)

## NovoRapid®

Insulin aspart, a rapid-acting insulin for bolus coverage

## Type 1 Diabetes Mellitus (T1DM, type 1 diabetes)

A metabolic disorder that occurs because of little or no insulin production from beta cells in the pancreas, causing high BG

## Type 2 Diabetes Mellitus (T2DM, type 2 diabetes)

A metabolic disorder that occurs because of the body's resistance to insulin causing high BG

## WELCOME MESSAGE

We know that it can be challenging when people with type 2 diabetes are offered insulin treatment by their healthcare team. This book is hence specially created for people with type 2 diabetes journeying with insulin. You may be someone who has just been offered insulin treatment and have some queries, someone keen and ready to start but not quite sure how, or someone who has been on insulin for a while and maybe preparing to travel.

We have put together a set of information about type 2 diabetes treatment surrounding insulin. These include commonly asked questions, key facts and information relevant to the local context. We hope to guide you through your journey and support you wherever possible.

It takes time to understand why you need insulin. You are not alone! This book will guide you through some of these concepts. Always feel free to check back with your healthcare team to clarify any potential gaps and doubts that this book does not cover.

Sincerely,  
NHG Diabetes School



# CHAPTER 1: TYPE 2 DIABETES: AN OVERVIEW

### Learning Objectives:



1. Understand type 2 diabetes and the concept of insulin resistance
2. Know the natural progression of type 2 diabetes
3. Understand the reasons and benefits of starting insulin therapy

## 1.1 Type 2 diabetes: a condition of insulin resistance

Insulin is produced by the pancreas in the body. Diabetes happens when the body is not able to maintain normal blood glucose (BG) levels through effective insulin production and action.

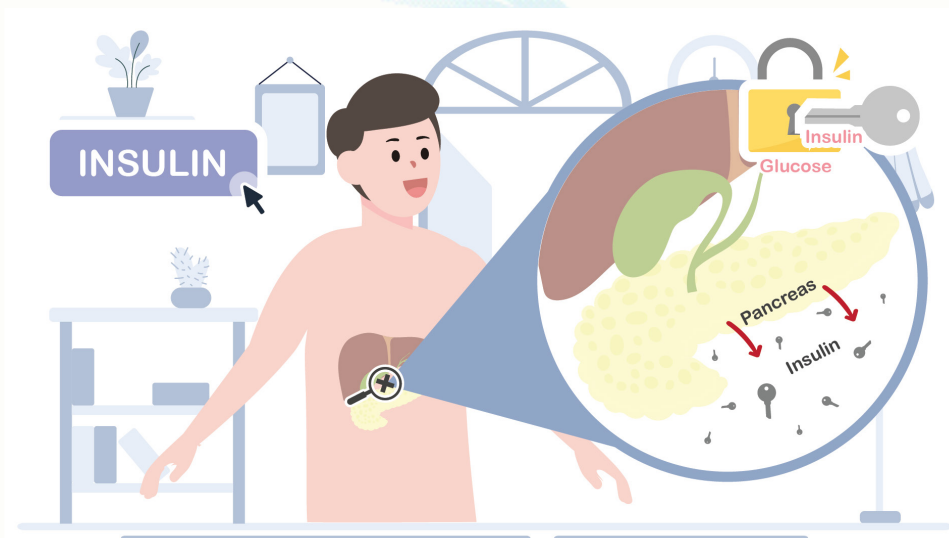


Figure 1.1: Insulin production and action

Type 2 diabetes is the most common form of diabetes. It is a condition where BG levels rise to unhealthy levels due to the body's inability to make use of insulin effectively to take glucose into the body's cells. This is also known as **insulin resistance**.

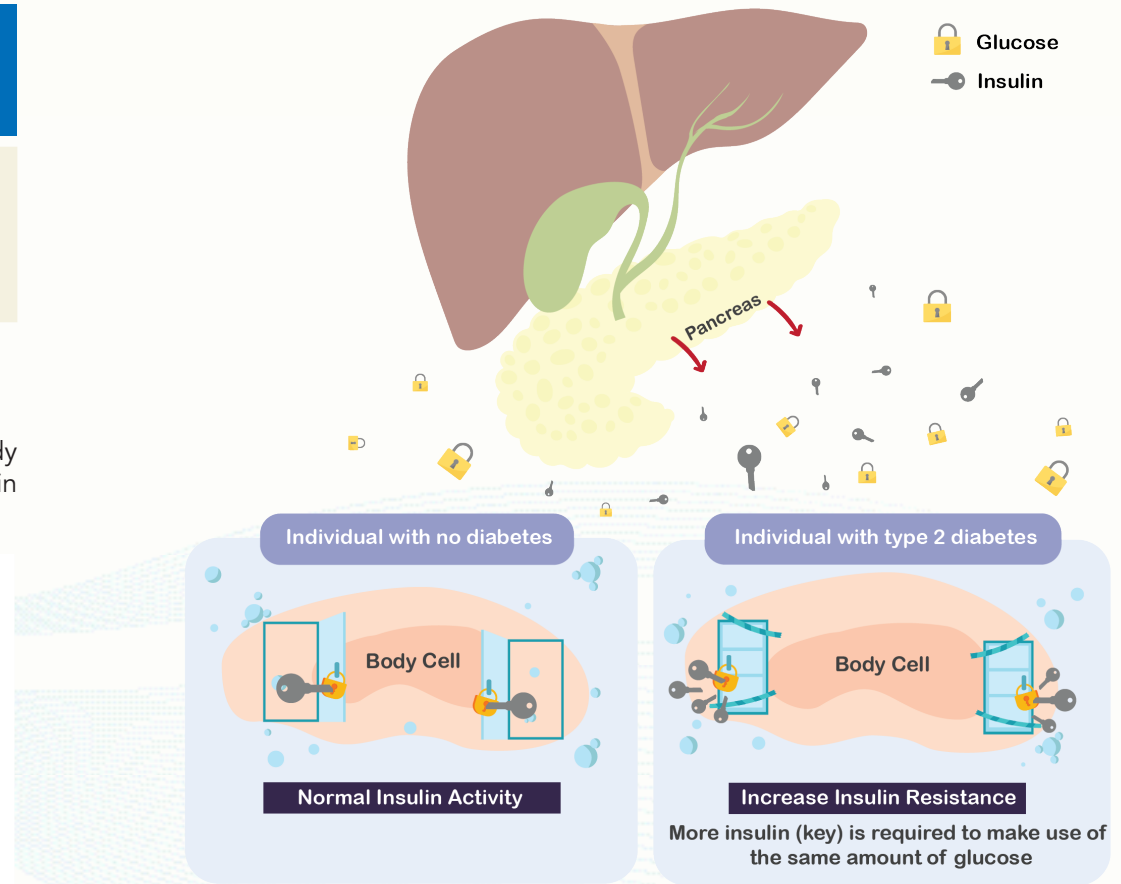


Figure 1.2: Comparison between an individual with no diabetes and type 2 diabetes



The following factors that lead to higher insulin resistance and/or type 2 diabetes:

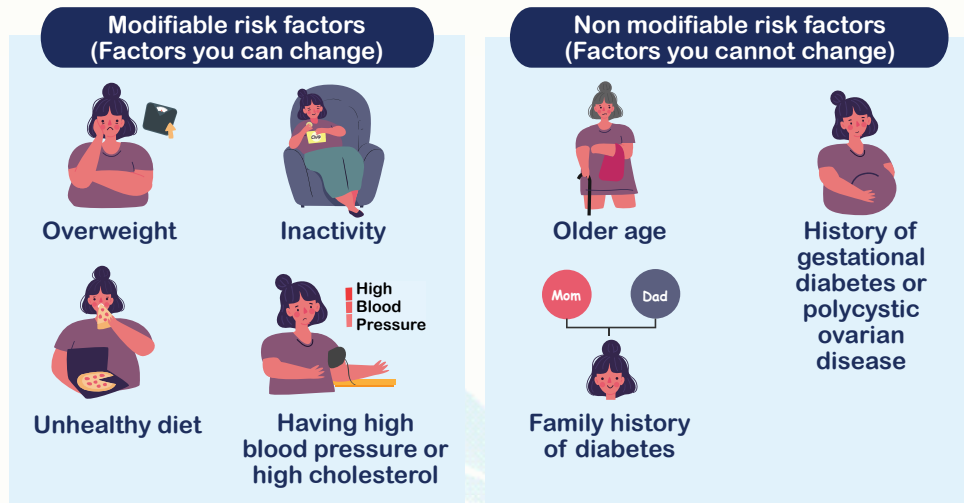


Figure 1.3: Factors leading to higher insulin resistance and or type 2 diabetes

With increased insulin resistance, the pancreas will need to work harder to produce more insulin to try to bring BG levels down to healthy levels. Over time, the pancreas will not be able to work well and type 2 diabetes develops.

People with type 2 diabetes can work on factors such as eating a low fat diet, reducing body weight and exercising. This will improve insulin resistance and reduce the need or dose of insulin required.

## 1.2 Diabetes remission: type 2 diabetes reversal in the early stages

Many often ask if there is a cure for type 2 diabetes. While there is no cure for type 2 diabetes, it is possible for you to work towards reversing it! The key is to understand insulin resistance and work on it for good diabetes control and even reversal.

Diabetes reversal (remission) happens when BG improves with **sustained lifestyle efforts** to non-diabetic range where no medications are required. Some of these are working on modifiable risk factors such as lifestyle changes which include having a healthy diet, regular exercise and weight loss. The earlier this is done upon the diagnosis of type 2 diabetes, the more likely one could successfully reverse the diabetes.

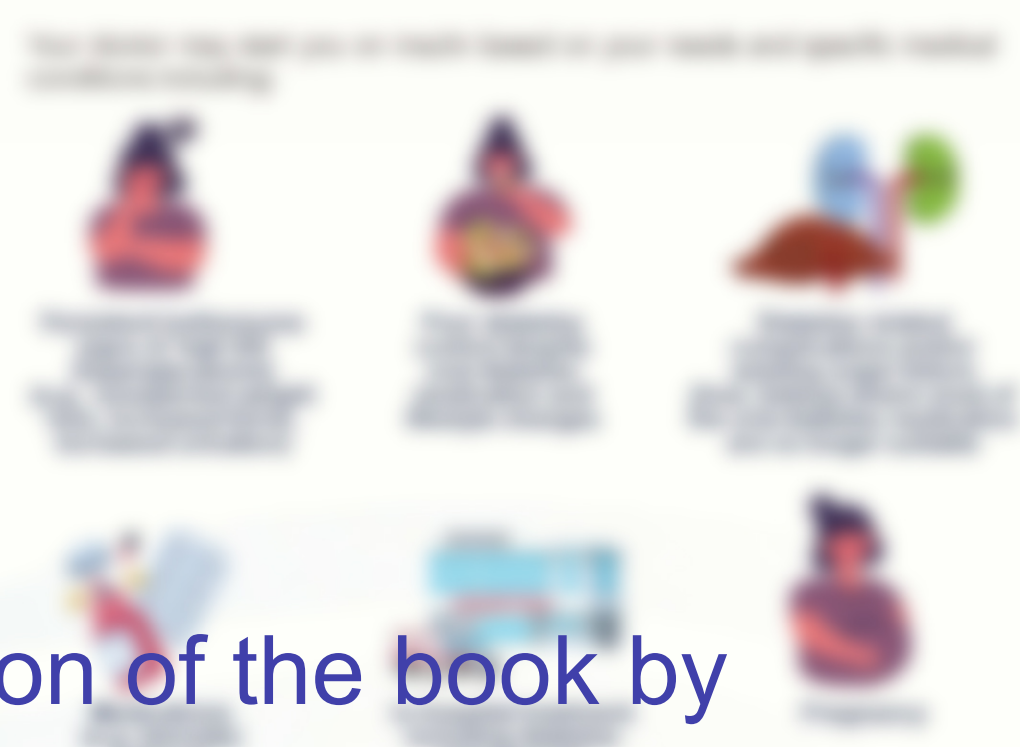
Some patients may not be able to achieve complete remission and to stop all medications, but many can reduce the dose of their usual diabetes medications including insulin.



Figure 1.4: Modifiable risk factors (Factors you can change)

## 1.3 Reasons for starting insulin therapy

Type 2 diabetes is known to be a progressive disease. As mentioned earlier, lifestyle changes and 1 to 2 types of diabetes tablets may be enough to manage good diabetes control. Eventually, most people with type 2 diabetes will require insulin treatment as the pancreas will not be able to produce enough insulin on its own to make use of these oral diabetes medication to lower BG.



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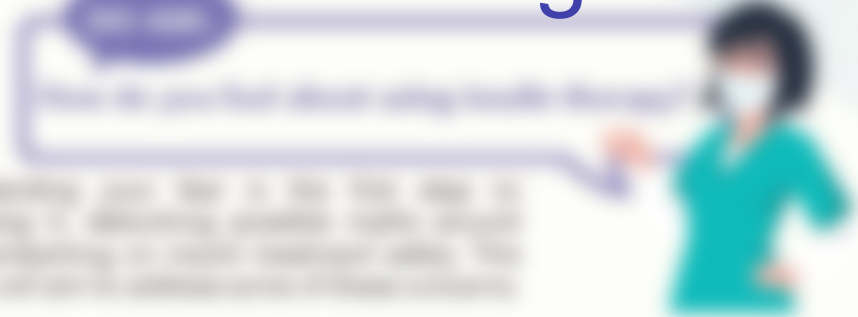


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## CHAPTER 3 CONCEPTS OF HEALTH

- Learning Objectives**
1. Define health and its components.
  2. Explain the relationship between health and well-being.
  3. Discuss the role of health in society.

This chapter discusses the concept of health, its components, and its role in society. It also explores the relationship between health and well-being, and the role of health in society.

- Key Concepts**
- Health is a state of complete physical, mental, and social well-being, and not merely the absence of disease or infirmity.
  - Health is a dynamic process that changes over time.
  - Health is influenced by a variety of factors, including genetics, environment, and lifestyle.
  - Health is a social construct that varies across cultures and societies.

## CHAPTER 4 HEALTH AND WELL-BEING



This chapter discusses the concept of health and well-being, and the relationship between them. It also explores the role of health and well-being in society, and the impact of various factors on health and well-being.

- Key Concepts**
- Health and well-being are related but distinct concepts.
  - Health is a state of complete physical, mental, and social well-being, and not merely the absence of disease or infirmity.
  - Well-being is a state of complete physical, mental, and social well-being, and not merely the absence of disease or infirmity.
  - Health and well-being are influenced by a variety of factors, including genetics, environment, and lifestyle.

This chapter discusses the concept of health and well-being, and the relationship between them. It also explores the role of health and well-being in society, and the impact of various factors on health and well-being.

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**Congratulations for coming to the end of the FITT2 book! We hope that you have read through the contents thoroughly and will practice the concepts learnt. We wish you the very best in your journey with diabetes.**

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