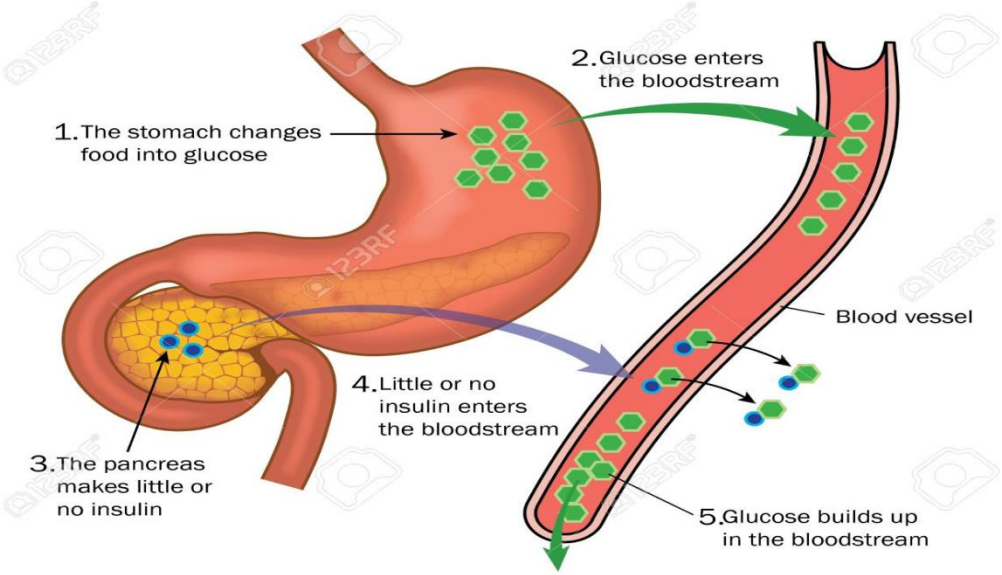
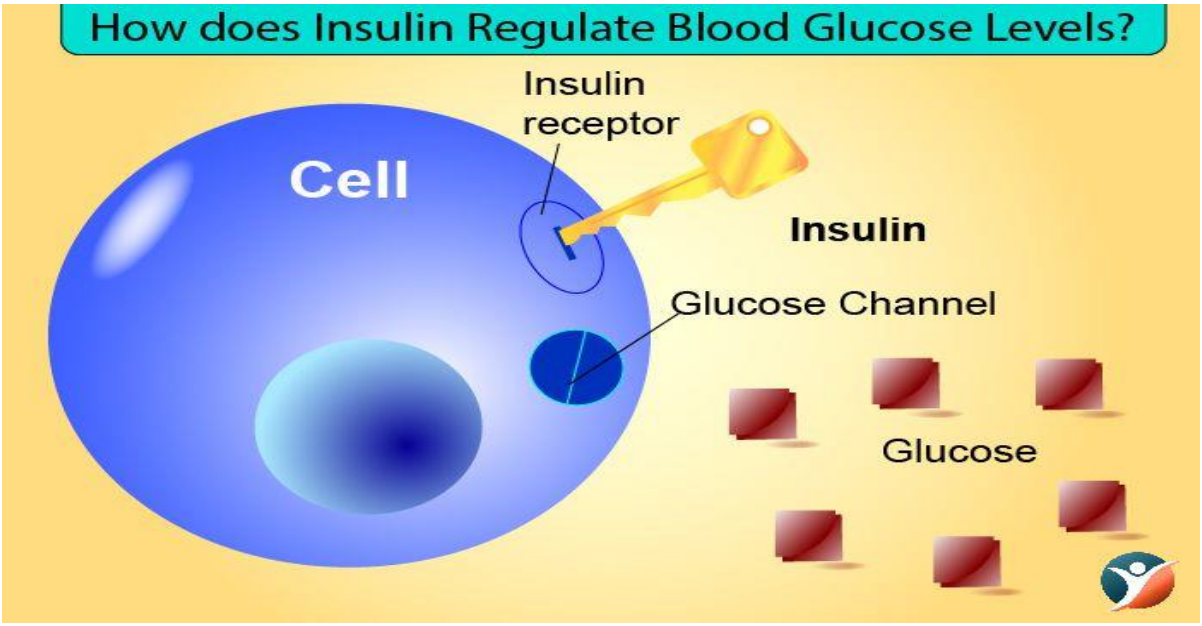
7. What is Insulin Resistance?

The World Health Organization (WHO) consultation team met in January 2002 to review the cause of Food and lifestyle diseases such as Obesity, Type2 Diabetes, and Heart disease. The key finding of the international health experts was that Insulin resistance is the root cause of these diseases. The experts' opinion was that a drastic change in diet and inadequate physical activity amongst the population over the past 25-30 years is the primary cause of Insulin Resistance. To understand Insulin resistance, one has to know about Glucose, Insulin hormone, the cause of insulin resistance, and the harmful effects of Insulin resistance.

- ***Insulin hormone and Insulin resistance***—Insulin is a hormone produced by the pancreas gland's specialized beta cells. Insulin is the essential hormone that helps convert glucose into energy inside the body cells. Without Insulin, the human cannot survive for more than a few days. The function of Insulin is to assist body cells in taking up glucose from the bloodstream. Insulin works like a key that unlocks the door on the cell wall so the glucose can enter. Once inside the cell, glucose is converted to the energy necessary for survival.

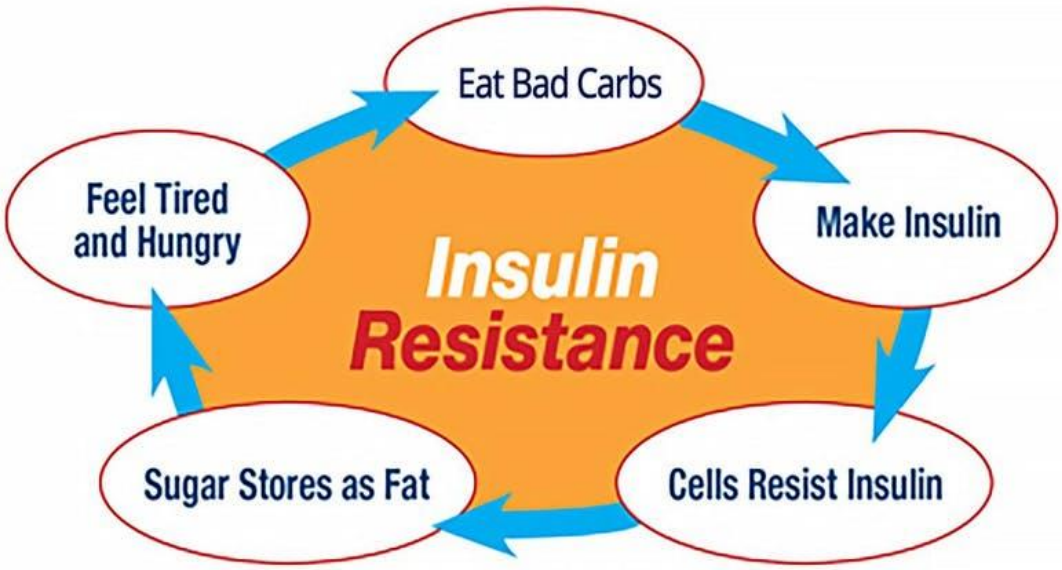


Glucose absorption from digestive tract and Insulin from pancreas



Insulin lock and key on the cell for control of Glucose entry

The cells are very protective about how much glucose can enter because too much glucose damages the cell itself. So when the insulin levels become high, the cells shut down the door, and the Insulin key has difficulty unlocking the door. This phenomenon is called Insulin Resistance. Insulin levels in the body become high when there is more glucose in the body from eating sugary foods and being physically inactive.



The vicious cycle of Insulin resistance

- ***What is glucose, and what does it do for the body***—The Food has three essential macronutrients- Carbohydrates, proteins, and fats. The term Macronutrients means the body needs these in large amounts. The food also has micronutrients required by the body in small quantities, such as vitamins and minerals. A healthy diet is natural (vegetables, fruits, ancient whole grains, and natural cold compressed cooking oils) and not commercial (refined sugars, refined cooking oils, and refined wheat flour and rice). The Healthy diet should have macronutrients in the following proportion:

Carbohydrates ------50-60%
Proteins----------25-30%
Fats----------20-25%

Carbohydrates are the primary source of energy in the body. These get broken down to glucose in the digestive tract. The glucose gets absorbed into the bloodstream. Based on how much glucose gets produced in the digestive tract, the carbohydrates fall into two groups:

a) **High Glycemic unhealthy Carbohydrates**- Sugary commercial foods and drinks, including fruit juices, lead to high blood glucose levels. The high glucose levels mean the pancreas gland has to produce an enormous amount of Insulin. High Insulin levels bring down the level of glucose in the bloodstream fast. When the glucose level goes down quickly, the person gets food cravings and overeats. Therefore, sugary commercial food and drinks create a vicious cycle of overeating, high glucose, and high insulin levels. High insulin levels are the biggest reason for causing insulin resistance.

b) **Healthy low Glycemic Carbohydrates**- Compared to commercial foods, natural foods such as vegetables and whole grains produce low blood glucose levels. The pancreas produces less Insulin. So the blood levels of glucose remain in the normal range for many hours. That means no food cravings and overeating.

   Therefore, in contrast to commercial high glycemic foods, the natural low glycemic foods keep appetite under control and prevent overeating, and therefore, insulin resistance, overweight/Obesity, and PCOS. Keep in mind that abdominal Obesity (wider waistline)) suggests the presence of Insulin resistance.

High GI vs Low GI Foods