

TYPE 5 DIABETES: CHRONIC UNDERNUTRITION

UNDERSTANDING TYPE 5 DIABETES MELLITUS (T5DM)



The concept of T5DM refers to **severe insulin-deficient diabetes (SIDD)**, characterized by **elevated levels of insulin deficiency and poor metabolic control**

T5DM, also known as **malnutrition-related diabetes mellitus**, is **primarily caused by chronic undernutrition**, especially during childhood or adolescence

Believed to stem from **impaired pancreatic development due to long-term nutrient deficiencies**

TYPE 5 DIABETES: A GLOBAL HEALTH EQUITY CHALLENGE



2025

Recognition Year

Official classification by the International Diabetes Federation (IDF)



20 to 25 Million

Global Burden

Estimated people affected worldwide by Type 5 diabetes mellitus



2

Primary Regions

Parts of South and Southeast Asia and Sub-Saharan Africa

DISTINCTIVE CLINICAL FEATURES OF TYPE 5 DIABETES MELLITUS

No autoimmune or genetic cause



Low body fat percentage compared to T2DM patients



Severely inadequate protein, fiber, and micronutrient intake



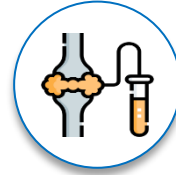
Very low BMI ($<18.5 \text{ kg/m}^2$), lower than in typical T2DM



Extremely low insulin levels ($< \text{T2DM}$, slightly $> \text{T1DM}$)

Comprehensive Diagnostic Approach for Type 5 Diabetes Mellitus

Integrating clinical, immunogenetic, laboratory, and nutritional assessments for accurate T5DM identification



Immunogenetic Analysis: Absence of autoimmune markers (e.g., GAD antibodies) rules out type 1 diabetes



Blood Tests: Elevated fasting blood glucose (**>126 mg/dL**) or HbA1c (**>6.5%**) without ketosis

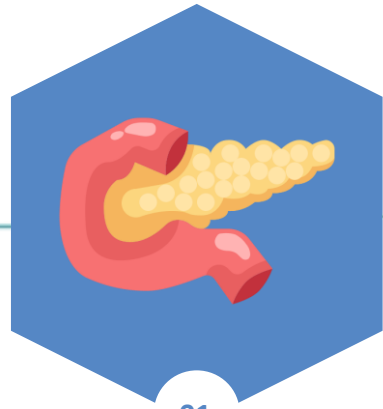


Nutritional Assessment: Low BMI, protein deficiency, or micronutrient imbalances support a type 5 diagnosis



Clinical History: History of malnutrition or residence in high-risk regions

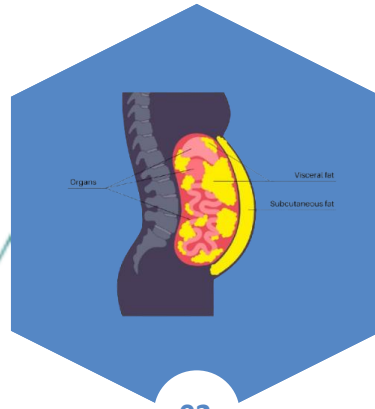
MECHANISMS OF TYPE 5 DIABETES MELLITUS



01

Impaired B-Cell Function

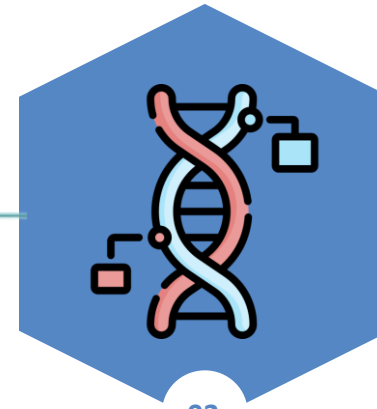
Malnutrition **hampers beta cell development and insulin production**, predisposing individuals to **glucose intolerance and diabetes later in life**, especially during catch-up growth



02

Insulin Resistance

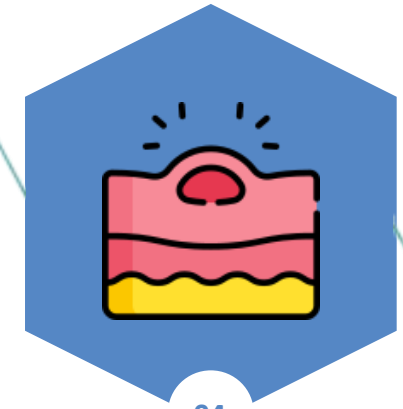
Chronic undernutrition **reduces skeletal muscle mass**, the major site for glucose uptake, **leading to reduced insulin sensitivity**



03

Epigenetic Changes

Malnutrition causes changes (**e.g., DNA methylation**) that permanently **alter genes related to insulin signaling** and glucose metabolism, increasing lifelong risk



04

Inflammatory Pathways

A persistent low-grade inflammatory state is induced, contributing to **Beta-Cell Dysfunction and insulin resistance**