IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429
Volume 5, Issue 1, November 2025
Impact Factor: 7.67

A Critical Review on Diabetes Mellitus Type 1 and Type 2 Management Approaches: From Lifestyle Modification to Current and Novel Targets and Therapeutic Agents

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Abstract: *Diabetes mellitus represents one of the most significant global health challenges of the 21st century, affecting over 537 million adults worldwide. The management of both type 1 diabetes (T1D) and type 2 diabetes (T2D) has evolved dramatically over the past decades, transitioning from rudimentary insulin therapy and dietary restrictions to sophisticated, personalized treatment regimens incorporating cutting-edge pharmacological agents and technological innovations. This comprehensive review critically examines the spectrum of therapeutic approaches for diabetes management, encompassing lifestyle modifications, conventional pharmacotherapy, and emerging novel therapeutic targets. We explore the pathophysiological distinctions between T1D and T2D that necessitate different management strategies, evaluate the efficacy and limitations of current treatment modalities, and discuss promising investigational therapies including immunomodulatory agents, beta-cell regeneration strategies, incretin-based therapies, SGLT inhibitors, and gene therapy approaches. Additionally, we address the integration of continuous glucose monitoring systems, insulin pump technology, and artificial pancreas systems in contemporary diabetes care. Understanding the evolving landscape of diabetes therapeutics is essential for optimizing patient outcomes and reducing the substantial morbidity and mortality associated with this chronic metabolic disorder.*

Keywords: Type 1 diabetes, Type 2 diabetes, insulin therapy, GLP-1 receptor agonists, SGLT2 inhibitors, lifestyle modification, novel therapeutics, beta-cell preservation

DOI: 10.48175/IJARSCT-29628