

RECENT ADVANCES IN THE PHARMACEUTICAL MANAGEMENT OF DIABETES MELLITUS: EMERGING THERAPIES AND THE ROLE OF ONCE-WEEKLY INSULIN ICODEC (AWIQLI)

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ABSTRACT

Diabetes mellitus, a multifaceted metabolic disorder, has emerged as a paramount global health concern, affecting over 463 million individuals worldwide. Diabetes causes serious consequences, such as retinopathy, nephropathy, and cardiovascular illnesses. It is characterized by persistent hyperglycemia brought on by either inadequate insulin secretion, impaired insulin action, or both. Consequently, scientists and or researchers will continue to find novel, safe, effective and affordable anti-diabetic medications. The goal of this review is to provide a through overview of the role that lifestyle changes play in managing diabetes, as well as day to day foods manage in diabetes mellitus. There are three types of 1 diabetes mellitus (T1DM) and Type 2 diabetes mellitus and gestational diabetes. In this condition Conventional insulin therapy generally requires daily injections, which may reduce treatment adherence in some patients. Traditional treatment includes metformin, sulfonylureas, thiazolidinedione's, DPP-4 inhibitors, SGLT2 inhibitors, GLP-1 receptor agonists and insulin preparations. One of the important *recent advances is insulin icodec, marketed as Awikli, a long-acting basal insulin designed for once-weekly administration*. Clinical studies have demonstrated that once-weekly insulin icodec can provide glycemic control comparable to commonly used once-daily basal insulins in adults with diabetes. Meta-analyses have also reported effective HbA1c reduction and similar overall safety compared with daily basal insulin, although hypoglycemia and other adverse effects remain important considerations. Awikli (insulin icodec) was authorized in the European Union in 2024 and received US FDA approval on March 26, 2026, for improving glycemic control in adults with type 2 diabetes mellitus.

KEYWORDS: Diabetes mellitus; Type 1 diabetes mellitus; Type 2 diabetes mellitus; Gestational diabetes mellitus; Diabetes pharmacotherapy; Antidiabetic drugs; Insulin therapy; Basal insulin; Insulin icodec; Awikli; Once-weekly insulin; Glycemic control; HbA1c; Lifestyle modification; Dietary management; Hypoglycemia; Diabetes complications; Emerging therapies; Pharmaceutical management; Personalized diabetes care.

INTRODUCTION

Diabetes mellitus is a chronic disease caused by inherited and acquired deficiency in the production of insulin by the pancreas, or by the ineffective action of insulin produced. This deficiency in the production of insulin by the pancreas results in an increase in the concentrations of glucose in the blood. This insulin deficiency risks the damage to several body systems such as the blood vessels and nerves.

The sign and symptoms of diabetes mellitus include weight loss, polyuria, polyphagia, polydipsia, blurring of vision. The increased blood glucose level in diabetes mellitus leads.

1] Types of diabetes mellitus

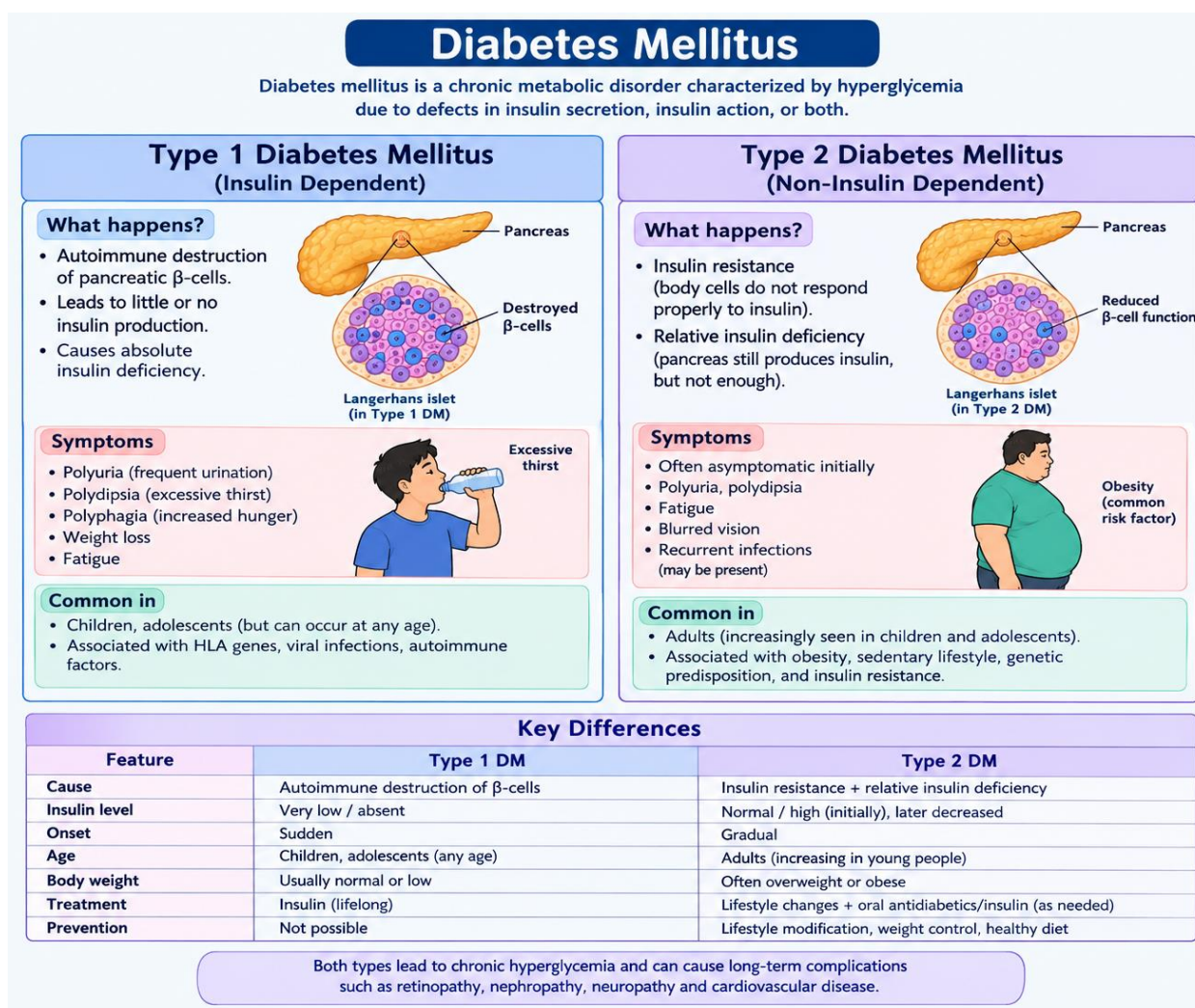
A] Type 1 diabetes mellitus: a chronic autoimmune condition where the immune system attacks and destroys the insulin-producing beta cells in the pancreas, meaning the body can no longer make insulin. That results from the body's failure to produce enough insulin. This form was previously referred to as "insulin-dependent diabetes mellitus" (IDDM) or "juvenile diabetes".

B] Type 2 diabetes mellitus: The cause is unknown Type 2 DM begins with insulin resistance, a condition in which cells fail to respond to insulin properly. As the disease progresses a lack of insulin may also develop. This form was previously referred to as "non-insulin-dependent diabetes mellitus" (NIDDM) or "adult-onset diabetes". The primary cause is excessive body weight and not enough exercise.

C] Gestational diabetes mellitus: diabetes, is the third main form and occurs when pregnant women without a previous history of diabetes develop a high blood glucose level.

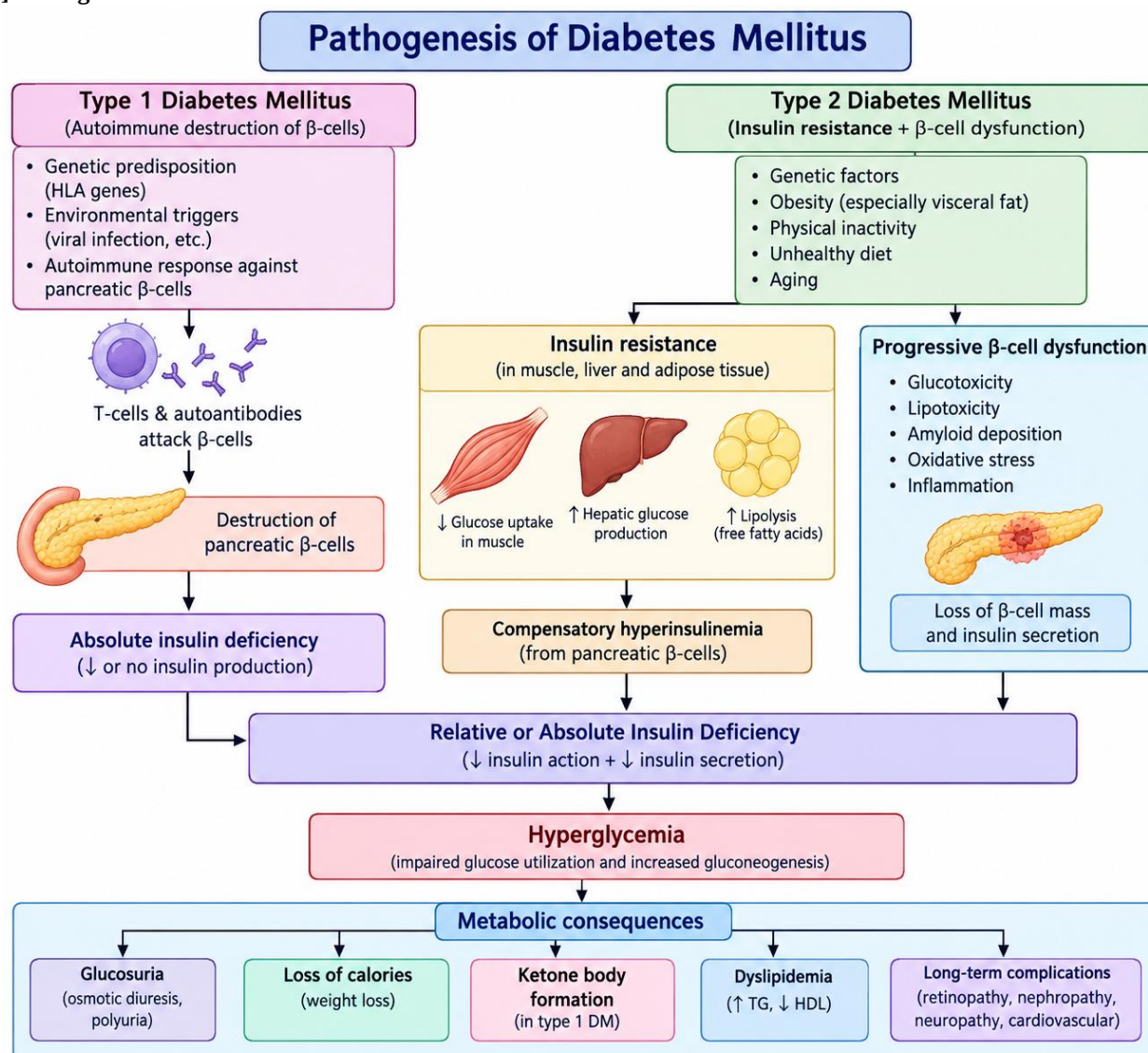
2] The major goals of pharmacological therapy are to

1. Control blood glucose and HbA1c.
2. Prevent acute complications.
3. Reduce cardiovascular and renal complications.
4. Avoid hypoglycemia.
5. Control body weight where appropriate.
6. Improve quality of life.
7. Provide convenient and sustainable treatment.



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3] Pathogenesis of diabetes mellitus

4] Prevention: Prevention and treatment involves a healthy diet, physical exercise, not using tobacco, and being a normal body weight. Blood pressure control and proper foot care are also important for people with the disease.

1. Avoid sugary drinks – Reduce soft drinks, packaged juices and energy drinks.
2. Control portion size – Avoid overeating even when the food is healthy.
3. Increase fibre intake – Include oats, whole grains, vegetables and pulses.
4. Reduce refined carbohydrates – Limit maida, white bread, polished rice and sweets.
5. Stay physically active – Avoid sitting continuously for long periods.

6. Get adequate sleep – Maintain a regular sleep schedule.
7. Control blood pressure and cholesterol – Regular monitoring helps reduce metabolic risk.
8. Prevent excessive weight gain – Maintain a healthy waist circumference.
9. Regular screening for prediabetes – Early detection allows lifestyle changes before diabetes develops.
10. Follow a healthy routine – Regular meals, exercise and adequate rest help maintain glucose control.

5] Diagnosis of diabetes mellitus

Diagnosis of Diabetes Mellitus

Diabetes mellitus is diagnosed based on plasma glucose levels (fasting, random or after oral glucose tolerance test) or HbA1c levels.

Test	Diagnostic Cut-off (any one)	Notes
Fasting Plasma Glucose (FPG) (after at least 8 hours of fasting)	$\geq 126 \text{ mg/dL}$ (7.0 mmol/L)	- Measured in venous plasma. - Fasting means no calorie intake for at least 8 hours.
2-hour Plasma Glucose (OGTT) (after 75 g oral glucose)	$\geq 200 \text{ mg/dL}$ (11.1 mmol/L)	- Patient should be on normal diet (≥ 3 days) before the test. - Measured 2 hours after glucose load.
Random Plasma Glucose (at any time, with symptoms)	$\geq 200 \text{ mg/dL}$ (11.1 mmol/L)	Symptoms include: polyuria, polydipsia, unexplained weight loss, etc.
HbA1c (glycated hemoglobin)	$\geq 6.5\%$ (48 mmol/mol)	Reflects average glucose level over the past 2–3 months.

Additional Tests (to support diagnosis)

- Fasting blood sugar (most common initial test).
- Postprandial (2-hour after meal) glucose.
- Oral glucose tolerance test (OGTT) – if FPG is borderline or suspicion is high.
- HbA1c – useful for long-term control and diagnosis (especially when FPG/OGTT is not convenient).
- Urine test – presence of glucose (not diagnostic alone).



Fasting / Random blood glucose



2-hour OGTT (75 g glucose)



HbA1c test

Criteria for Diagnosis

Diabetes mellitus is diagnosed if **any one** of the above criteria is met (confirmed by repeat testing on a different day unless there are clear symptoms).

Note

- If the first test is abnormal, **repeat** the test on a different day (except in obvious hyperglycemia with symptoms).
- HbA1c $\geq 6.5\%$ can be used for diagnosis even without fasting.
- Always interpret results with clinical symptoms and history.

6] Treatment

Treatment of Diabetes Mellitus

The main aim is to control blood glucose and prevent complications.

1. Lifestyle modification

- Healthy, balanced diet
- Regular physical activity
- Maintain a healthy body weight
- Avoid smoking and limit alcohol
- Regular monitoring of blood glucose

2. Pharmacological treatment

A. Type 1 Diabetes

- Insulin is essential
- Short/rapid-acting insulin
- Intermediate/long-acting insulin
- Insulin can be given by injection or, in suitable patients, newer formulations/devices.

B. Type 2 Diabetes Common medicines include

Metformin – usually first-line
 Sulfonylureas
 DPP-4 inhibitors
 SGLT2 inhibitors
 GLP-1 receptor agonists
 Thiazolidinedione's

Insulin, when required

3. Management of complications

Regular monitoring and treatment of

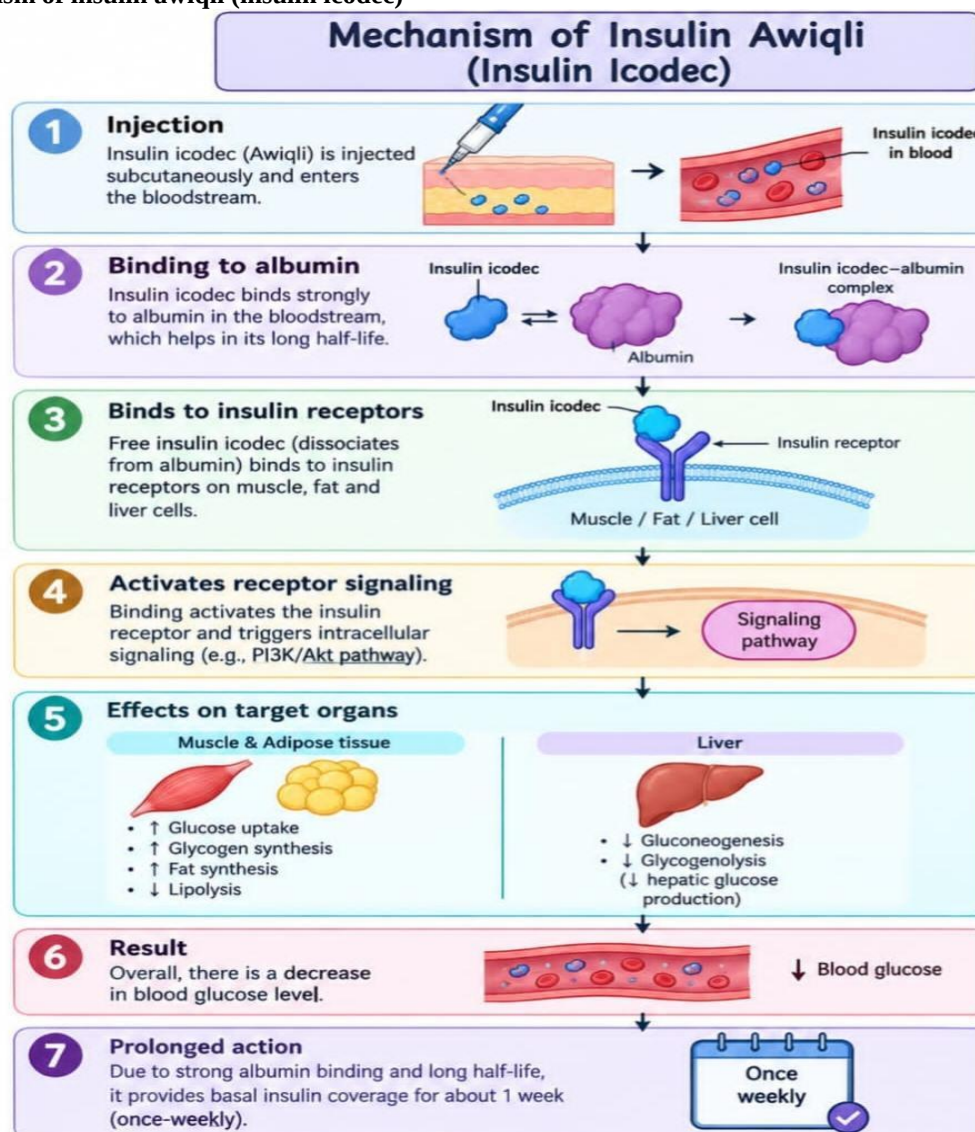
Diabetic retinopathy
 Kidney disease
 Neuropathy
 Cardiovascular disease

4. Newer Insulin Therapy: insulin icodec (Awiqli) is a new generation first once-weekly basal insulin available in the U.S. for adults with type 2 diabetes. Following FDA approval in March 2026, Novo Nordisk's Awiqli (insulin icodec-abae) is now available at more than 70,000 pharmacies in the U.S. Awiqli is also available in Australia, Canada, the EU, China, Japan, and other countries.

The insulin is to be injected using a prefilled pen on the same day each week. The prescribing information notes that when switching from daily basal insulin, glucose levels need to be monitored closely because dosing is different with Awiqli's long-lasting action, and hypoglycemia remains the most common side effect. Weekly dosing comes with its own learning curve, and the label makes clear that dose mix-ups and low blood sugar are important concerns. But for anyone with type 2

who has delayed starting basal insulin, struggles to consistently take a daily shot, or just wants a simpler routine, once-weekly insulin could be a better fit.

A. Mechanism of insulin awiqli (insulin icodec)



B. Dosing: It is administered once weekly on the same day each week, reducing the injection burden from daily injections to approximately 52 injections per year.

C. Clinical evidence: The phase 3 ONWARDS clinical programme demonstrated effective glycemic control with once-weekly insulin icodec compared with daily basal insulin in adults with type 2 diabetes. PR Newswire.

D. Regulatory advancement: Awiqli was approved by the FDA on 26 March 2026 for improving glycemic control in adults with type 2 diabetes. U.S. Food and Drug Administration.

E. Availability in India: Awiqli was launched in India in July 2026, providing a new once-weekly basal-insulin option.

F. Advantages of insulin awiqli (insulin icodec)

1. Once-weekly dosing – requires only one injection per week.
2. Improves adherence – fewer injections can make treatment easier for patients.
3. Long duration of action – provides basal insulin coverage throughout the week.
4. Good glycemic control – helps maintain blood glucose at a controlled level.
5. Reduces injection burden – fewer injections compared with daily basal insulin.
6. Predictable insulin action – designed to provide relatively stable basal insulin levels.

7. Convenient for patients – useful for people who find daily injections difficult.

G. Disadvantages of Insulin Awikli

1. Risk of hypoglycemia – blood glucose may become too low, especially if the dose is excessive.
2. Injection-site reactions – redness, swelling, or pain may occur.
3. Weight gain – insulin therapy can cause weight gain in some patients.
4. Long half-life – if hypoglycemia or an incorrect dose occurs, the prolonged action can make adjustment slower.
5. Dose adjustment is less flexible – changes cannot be corrected as quickly as with a shorter-acting daily insulin.
6. Not suitable for emergencies – it is a basal insulin and does not replace rapid-acting insulin when mealtime control is required.
7. Cost/availability – may be more expensive or less widely available than established insulin preparations.

H. Uses of Insulin Awikli

Awikli (insulin icodec) is a once-weekly long-acting basal insulin used to control blood glucose.

1. Treatment of Type 1 diabetes mellitus – used as basal insulin along with mealtime/bolus insulin.
2. Treatment of Type 2 diabetes mellitus – helps control high blood glucose when insulin therapy is required.
3. Maintains basal insulin levels for about one week because of its long duration of action. Reduces the need for daily basal insulin injections, which may improve convenience and adherence.
4. Helps maintain stable blood glucose levels between meals and overnight.

6] Conclusion – Pharmacological Management of Diabetes Mellitus

Pharmacological management of diabetes mellitus has advanced from conventional insulin and oral antidiabetic drugs to newer therapies such as GLP-1 receptor agonists, SGLT2 inhibitors, DPP-4 inhibitors, and modern insulin analogues. Treatment is individualized according to glycemic control, cardiovascular and renal risk, body weight, age, and patient preference.

A major recent development is Awikli® (insulin icodec), a once-weekly basal insulin. It can reduce basal-insulin injections from seven per week to one, potentially improving treatment convenience and adherence. Clinical trials in adults with type 2 diabetes demonstrated effective HbA1c reduction with a safety profile broadly consistent with daily basal insulin.

Importantly, in March 2026, the U.S. FDA approved Awikli for adults with type 2 diabetes, making it the first FDA-approved once-weekly basal insulin.

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