Exploration of Endocrine and Metabolic Diseases

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Expert Consensus on Type 2 Diabetes Remission

Endocrinology and Metabolism Physician Branch of Chinese Medical Doctor Association*

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Abstract

Establishing remission as a clinical goal for carefully selected patients with Type 2 Diabetes Mellitus (T2DM) represents a fundamental shift from the traditional paradigm of lifelong disease management. Short disease duration, preserved C-peptide levels, and overweight or obesity are the central criteria for T2DM remission. T2DM remission may help reduce the psychological burden on patients, improve quality of life, delay disease progression, and reduce the risk of long-term complications. This consensus aims to help physicians establish standardized clinical diagnosis and treatment protocols for T2DM remission in overweight or obese patients with T2DM, and support related research to develop safer and more effective interventions. Notably, T2DM remission is conditional, reversible and population-selective, which is not universally applicable to all T2DM patients across different disease stages and healthcare settings.

Keywords

Type 2 Diabetes Mellitus, remission, consensus, delphi method, lifestyle intervention

GRADE: Grading of Recommendations Assessment, Development and Evaluation

Methodology: Consensus Development Process

This consensus was developed in accordance with the WHO Guideline Preparation Manual, AGREE II and standardized Delphi reporting requirements. A professional methodology team was established to complete evidence retrieval, quality evaluation and recommendation formation.

Expert Selection

A total of 68 experts in endocrinology, metabolism, nutrition, exercise therapy, metabolic surgery and epidemiology were enrolled. All experts met the criteria of senior professional title, ≥ 10 years of clinical/research experience in diabetes, high academic influence and no commercial conflicts of interest.

Delphi Survey Procedure

- Three rounds of anonymous Delphi surveys were conducted;
- Predefined consensus threshold: ≥ 80% agreement among panel experts;
- Divergent opinions were resolved through evidence supplementation and collective discussion;
- Final recommendations were determined based on high-quality evidence and unified expert views.

Ethics Statement

This consensus is a purely academic guidance document without human or animal experiments, so ethical approval was waived in accordance with relevant regulations.

Type 2 Diabetes Mellitus (T2DM) is widely acknowledged as a progressive condition characterized by hyperglycemia, resulting from a complex interplay of genetic and environmental factors. This condition necessitates long-term management with hypoglycaemic agents. However, a shift in this paradigm has been emerging as our understanding of T2DM evolves alongside an accumulation of evidence-based medical findings.

Lifestyle-induced changes have contributed to a year-on-year increase in diabetes prevalence, predominantly attributed to rising levels of obesity and overweight. The prevalence of T2DM in obese individuals is three times that of those with normal body weight. When the waist circumference of men and women is ≥ 85 cm and ≥ 80 cm respectively, their prevalence of diabetes is 2.5 times that of individuals with normal waist circumference [1]. Furthermore, the prevalence of diabetes in overweight and obese individuals is higher than that in the general population, at 12.8% and 18.5% respectively, while the proportion of overweight and obese patients with diabetes is also higher, at 41.0% and 24.3% respectively [2].

Blood glucose levels rise progressively from normoglycemia to prediabetes and diabetes, with escalating hyperglycemia increasing the risk of diabetes-related complications. The current diagnostic thresholds for diabetes are determined by blood glucose or HbA1c levels that correlate with an increased risk of retinopathy, rather than marking a significant change in blood glucose dynamics. Theoretically, interventions aimed at improving the underlying pathophysiological factors, such as insulin secretion impairment, insulin resistance (IR), and obesity, could potentially reduce hyperglycemia or even restore blood glucose levels from a high to a more normal state. A straightforward classification system for T2DM, based on fasting C-peptide (FCP) levels, has been proposed: T1 (insulin-deficient type, FCP ≤ 1.0 μg/L, representing 25.21% of diabetes patients), T2 (impaired incretin type, FCP 1.0 to 2.5 μg/L, accounting for 51.63%), and T3 (insulin-resistant type, FCP ≥ 2.5 μg/L, making up 23.16%) [3].

Clinical studies have indeed confirmed this theoretical hypothesis, demonstrating that lifestyle modifications, pharmacological treatments, or metabolic surgery can not only slow the progression from prediabetes to diabetes but also induce remission of hyperglycemia by reducing blood glucose levels. However, since no intervention can permanently halt the natural progression of T2DM through staged treatments, maintaining remission requires ongoing intervention efforts.

There is robust evidence supporting the prevention of diabetes and impaired glucose tolerance (IGT) through the establishment of a healthy lifestyle. Studies such as the Daqing Study in China [4–6], the Diabetes Prevention Program (DPP) in the United States [7], and the Finnish Diabetes Prevention Study (DPS) [8] have illustrated that intensive lifestyle intervention can significantly mitigate the risk of developing T2DM among high-risk patients. These findings not only implicate an unhealthy lifestyle as a causative factor for diabetes but also present a viable preventative strategy.

For those already afflicted with T2DM, substantial clinical evidence supports the notion that intensive lifestyle changes and metabolic surgery among patients with a brief history of obesity-related T2DM can lead to significant weight reduction and diabetes remission [9, 10]. Moreover, short-term insulin therapy in recently diagnosed T2DM patients has shown promise in facilitating diabetes remission [11–15].

Achieving diabetes remission has the potential to liberate patients from long-term dependence on hypoglycaemic agents. It can alleviate psychological distress, enhance quality of life, bolster confidence in maintaining a healthy lifestyle, and postpone disease progression, thereby reducing the risk of long-term complications.

As early as 2016, the WHO Global Diabetes Report [16] clearly indicated that T2DM remission is attainable through weight loss and caloric restriction.

We advocate that, beyond lifestyle management, pharmacological prevention, treatment of complications, and improvement of quality of life for patients, early intervention through lifestyle and pharmacological measures in overweight and obese T2DM patients can significantly improve their weight status and induce diabetes remission. This approach should be considered an innovative strategy and a standard component of contemporary clinical practice in diabetes management.

To assist clinicians in standardizing the clinical management of T2DM remission among overweight and obese individuals, in fostering the advancement of pertinent research, and in ensuring that patients receive safe and efficacious interventions, the "Expert Consensus on Type 2 Diabetes Remission" has been developed (hereinafter referred to as the "Consensus"). This Consensus adopts the Delphi method for structured consensus development.

Grading of Evidence and Formation of Recommendations

In formulating this Consensus, we initially referred to the WHO Manual for the Preparation of Guidelines and AGREE (Appraisal of Guidelines, Research, and Evaluation) issued by the World Health Organization (WHO). A methodology group for guideline development was convened to draft a methodological work plan and to support the editorial committee in evidence evaluation tasks. The internationally recognized GRADE system was adopted to unify evidence grading and recommendation criteria, ensuring consistency between evidence quality and clinical recommendation strength. The grading of evidence and criteria for recommendations are delineated in Table 1.

Table 1. GRADE Level of evidence and grading criteria for recommendations.

Recommendation Grade	Level of Evidence	Description
Strong (A)	High (1)	Single multicenter RCT study (raw data open source); systematic reviews based on RCTs (with homogeneity, raw data open source); large sample data mining studies (raw data open source); meta-analysis and systematic reviews
Conditional (B)	Moderate (2a/2b)	Single RCTs (raw data not open-source); systematic reviews of classic case-control based studies (with homogeneity); large sample cohort studies (raw data open-source); single case-control study
Weak (C)	Low (3)	Case report; low-quality cohort study; cross-sectional study
Very Weak (D)	Very Low (4)	Expert opinion or comment

Definition of T2DM Remission

Recommendation 1: The Consensus adopts the definition of diabetes remission as outlined in the 2021 American Diabetes Association (ADA) report [17], "Definition and Interpretation of Remission in Type 2 Diabetes" (Evidence Level Very Low (4), Recommendation Level: D).

T2DM remission is characterized by the achievement and maintenance of normal blood glucose levels in the absence of glucose-lowering medication. It is important to recognize that T2DM remission does not imply a cure. Even after remission is achieved and the measures contributing to it are sustained, some patients may experience a resurgence of blood glucose levels that necessitate medical intervention, especially those with long disease duration or poor β-cell function.

The 2021 ADA consensus report suggests that a hemoglobin HbA1c level below 6.5%, maintained for at least three months after discontinuing hypoglycaemic agents, serves as the diagnostic criterion for T2DM remission. Additionally, the 2022 Expert Consensus Statement from the American College of Lifestyle

Medicine proposes that T2DM remission could be defined by an HbA1c level below 6.5% for at least three months, without reliance on surgery, devices, or pharmacological treatments specifically aimed at lowering blood glucose [18]. In scenarios where HbA1c may not accurately reflect blood glucose levels—such as in the presence of hemoglobin variants or conditions affecting red blood cell survival—alternative criteria like fasting plasma glucose (FPG) below 7.0 mmol/L or estimated glycosylated hemoglobin (eA1c) below 6.5% through continuous glucose monitoring may be applied [17]. Post-remission, it is mandatory to recheck HbA1c levels annually.

In contrast to T2DM remission, the resolution of prediabetes is marked by enhanced insulin sensitivity (IS) and a reduction in visceral adipose tissue (VAT). The concept of prediabetes remission, akin to T2DM remission, is based on the prevention of T2DM development through the restoration of normal glucose regulation (NGR). Achieving remission should be the primary goal in prediabetes management [19].

Mechanism of T2DM Remission

Recommendation 2: T2DM remission is associated with the alleviation of obesity and significant improvements in body weight, fatty liver, fatty pancreas, IR, hyperinsulinemia, correction of hyperglycemia, and partial reversal of the processes of islet β-cell dedifferentiation and transdifferentiation (Evidence Level Moderate (2a), Recommendation Level: B).

Correction of Islet β-Cell Dedifferentiation

In newly diagnosed T2DM patients with a disease duration of less than five years, a subset of β cells remains in the pancreas, many of which are in a state of rest or dedifferentiation, rendering them non-functional and incapable of insulin secretion. These "dormant β-cells" can potentially be reactivated through targeted interventions.

High glucose toxicity can lead to β-cell dysfunction, resulting in a significant reduction in insulin secretion. Factors contributing to islet β-cell dedifferentiation include the duration of diabetes, obesity, lipotoxicity, and IR [20]. This mechanism only applies to specific populations (e.g., patients with short disease duration and preserved β-cell reserve); however, it is not equivalent to permanent reversal of β-cell failure.

Correcting IR

During the early phases of T2DM, pancreatic β-cells compensate for hyperglycemia by increasing insulin secretion to maintain normoglycemia. In the initial stages of T2DM, approximately 50% of patients exhibit hyperinsulinemia. However, as diabetes progresses, β-cell function deteriorates, leading to an irreversible state. Addressing IR can lead to a significant improvement in β-cell function [9].

Correction of Obesity, Fatty Liver, and Fatty Pancreas

Recommendation 3: Implementing active weight control measures is crucial, with the objective of achieving a normal BMI. For T2DM patients with obesity, a weight loss of at least 10 kg (preferably 15 kg or more) or a reduction of at least 10% of body weight is recommended (Evidence Level Moderate (2a), Recommendation Level: B).

Obese and overweight T2DM patients frequently suffer from fatty liver disease. In cases of steatohepatitis, excess fat from the liver can infiltrate the pancreas, leading to the formation of fatty deposits (fatty pancreas), which adversely impacts islet β-cell function. A reduction in fat deposition in key organs, such as the liver, skeletal muscle, and pancreas, correlates with an increased likelihood of diabetes remission [9]. Emerging data from both in vivo and ex vivo studies involving non-diabetic and T2DM subjects, as well as pancreatic islets, suggest that direct enhancement of β-cell health may be achievable through interventions that alleviate metabolic stress. The resultant changes in islet cell molecular characteristics could serve as potential targets for strategies aimed at promoting T2DM remission through β-cell-focused actions [21].

Weight loss is pivotal for T2DM remission, particularly in cases associated with overweight or obesity. The extent of weight reduction is the most robust indicator of T2DM remission likelihood. The Diabetes Remission Clinical Trial (DiRECT) found that T2DM remission is achievable in obese patients over five years through weight loss. Remission rates increased with greater weight loss, reaching 86% for those losing over 15 kg [9]. The probability of remission is directly related to weight loss, but such intensive weight loss targets may not be feasible in resource-limited settings. An approximate 5% increase in remission rate for every 1% weight loss within the first six years post-diagnosis [22]. After an approximately 18% decrease in body weight, both groups had marked and similar improvements in hepatic IS, peripheral IS, and β-cell function [23]. Lifestyle-induced weight loss, when achieving a similar reduction in islet β-cell fat content as metabolic surgery, can result in T2DM remission even in patients with a normal BMI. A weight loss of 10% has been shown to induce T2DM remission in individuals classified as having a 'normal' BMI [24].

Studies provide direct evidence that changes in hepatic and pancreatic fat content and VLDL1 metabolism precede the return of β-cell function. The return of β-cell function was closely related to the fall in pancreatic fat [25].

Basic Conditions for T2DM Remission

A shorter duration of T2DM, enhanced β-cell function, and a higher baseline BMI are significantly correlated with remission. Patients newly diagnosed with T2DM who exhibit superior β-cell functionality and reduced Hepatic-IR fasting are more likely to experience remission through dietary interventions without the need for pharmacological intervention or weight loss. In contrast, patients who do not achieve remission, particularly those with diminished β-cell function and elevated Hepatic-IR fasting indices, are at the greatest risk of initiating glucose-lowering treatments after a five-year follow-up period [26]. The incidence of remission and the predictors of relapse, especially concerning baseline BMI, may vary significantly between East Asian and Western populations. Additionally, the correlation between BMI reduction and the likelihood of remission or relapse may show greater disparity in the transition from hyperglycemia to near-normal glucose levels [27].

Recommendation 4: Utilize the "ABCD" assessment method to ascertain the fundamental conditions for T2DM remission (Evidence Level Very Low (4), Recommendation Level: D).

Exclude Specific Types of Diabetes

The initial step involves excluding specific types of diabetes, including hypercortisolism, growth hormone tumors, glucagonomas, and certain genetic forms of diabetes. These conditions require appropriate treatment of reversible causes before diabetes management can be effectively addressed.

Exclude Autoimmune Diabetes

Autoimmune diabetes mellitus should be excluded, as it is characterized by a progressive decline in islet β-cells due to ongoing autoimmune attacks and is typically associated with a lower prevalence of obesity and overweight individuals. In such cases, there is no clinical evidence to support the remission of diabetes.

"ABCD" Assessment Method

Patients with a prolonged duration of T2DM, severe complications, and diminished islet function (FC-P < 1.0 ng/mL at the glycemic target) should also be excluded, as there is no clinical evidence to suggest the possibility of diabetes remission in this group.

The "ABCD" dimensions—Antibody status (A), BMI (B), C-peptide levels (C1), and complication assessment (C2), along with the disease's Duration (D)—offer a comprehensive framework for evaluating a patient's candidacy for T2DM remission.

1. A (Antibody status): Negative for glutamic acid decarboxylase antibody (GADA) and other islet-related antibodies, indicates that the patient does not have an immune response to the destruction of his or her own islets.

2. B (BMI): BMI ≥ 25 kg/m^2 (or waist circumference male > 90 cm, female > 85 cm).
3. C: (1) C1 (C-peptide levels, C-P): FC-P ≥ 1.1 ng/mL and 2 h C-P ≥ 2.5 ng/mL, means that there is still some β-cell function, which is a basis for diabetes remission [9]. (2) C2 (Complication assessment): In case of cardiovascular disease (CVD) and severe retinopathy, cardiopulmonary function should be evaluated. High-intensity exercise should be avoided to avoid accidents. In case of chronic kidney disease, a ketogenic diet and high protein diet should not be used as a remission plan.
4. D (Duration): Clinical evidence shows that patients with T2DM of ≤ 5 years in duration have a higher chance of achieving remission of diabetes after intervention.

Positioning and Core Boundaries of the ABCD Model

The ABCD model cannot generalize across ethnicities, ages, or mixed phenotypes. It is positioned as a screening heuristic for rapidly identifying potential T2DM remission candidates, rather than a rigid gatekeeper or a one-stop decision-making standard for remission eligibility.

Approaches to Achieve T2DM Remission

Intensive Lifestyle Intervention

A 7-year follow-up study of 122,781 newly diagnosed T2DM patients [28] revealed that the natural remission rate of T2DM without intensive intervention is quite low, with partial remission at 1.5%, complete remission at 0.14%, and long-term remission at 0.01%. Therefore, a robust intervention program is essential for achieving remission in T2DM.

Recommendation 5: Intensive lifestyle interventions are recommended as the foundational treatment for eligible T2DM patients (Evidence Level High (1), Recommendation Level: A).

T2DM is often referred to as a multifactorial metabolic disorder strongly associated with lifestyle risk factors, and a healthy lifestyle is the best preventive measure and the most effective treatment for achieving remission in obesity-related T2DM caused by poor lifestyle choices.

Intensive Lifestyle Intervention:

See Table 2 for details.

Table 2. Intensive lifestyle intervention recommendations for Type 2 Diabetes Mellitus remission.

Recommendation	Level of Evidence	Recommendation Grade
Implementing diabetes remission requires an interdisciplinary team that includes physicians, dietitians	2a	B
Reasonable weight loss measures are the basis for diabetes remission	1	A
A phased very low-energy diet can help patients achieve rapid remission	1	A
Energy-restricted diets, low-carb diets, and high-protein diets can help reduce weight and induce T2DM remission	2a	B
The treatment process can be supplemented with glycemic control foods, semi-meal substitutes, etc., to enhance satiety, slow down the absorption of carbohydrates, and play a supplementary role in glycemic control	2a	B

Diet and Nutritional Therapy:

Dietary intervention as a primary treatment for T2DM can lead to remission in many adults and is dependent on the intensity of the intervention. Diets emphasizing whole, plant-based foods with minimal consumption of meat and other animal products [18] are most effective for achieving remission. In an Australian primary care setting, a low-energy total diet replacement (TDR) resulted in T2DM remission in 86 (56%) of 155 participants at 12 months, with an average adjusted weight loss of 8.1% [29]. The likelihood of diabetes remission was directly proportional to weight loss, with 87% of participants achieving remission after losing more than 15% of their body weight. A systematic review [30] indicates that very low-energy diets are associated with the most significant weight loss outcomes. Based on data

from RCTs, patients who underwent initial low-energy TDR had a median remission rate of 54% after 1 year, compared to 11% and 15% for patients using meal replacements and Mediterranean diets, respectively [30]. In T2DM patients with comorbid obesity, various dietary approaches such as energy-balanced diets with exercise, low-carbohydrate diets (LCDs), very low-energy diets, intermittent fasting, and ketogenic diets can contribute to early T2DM remission, with a reduction in carbohydrates and an increase in protein intake being beneficial for both T2DM remission and prevention of progression from prediabetes to T2DM in the normal glucose tolerance (NGT) group [31].

A meta-analysis [32] that included 23 randomized controlled trials analyzed the effectiveness and safety of LCDs and very low-carbohydrate diets (VLCDs) for T2DM remission, defined as less than 26% of daily caloric intake from carbohydrates and less than 10% for VLCDs. The results showed a significant increase in the remission rate of diabetes, with substantial reductions in fasting blood glucose (FBG) and body weight, and significant improvements in IS in the LCD group at 6 months of follow-up. The ADDITION-Cambridge trial [33], a prospective cohort study involving 867 newly diagnosed T2DM patients, who were randomized to intensive lifestyle interventions or conventional treatment, found a significant increase in T2DM remission with weight loss of ≥ 10% in the first year or first five years post-diagnosis. This was observed even without intensive lifestyle interventions or extreme calorie restriction. Patients who lost ≥ 10% of their body weight were twice as likely to achieve T2DM remission compared to those who maintained their weight. These findings highlight the importance of weight control and suggest that diabetes remission can be achieved through dietary changes and increased physical activity.

Further well-designed trials with longer follow-up periods are required to determine whether scientific dietary management can sustain weight loss and lead to long-term remission of T2DM, as well as reduce the risk of complications such as CVD.

Exercise Intervention:

Exercise is a powerful tool for weight management and forms the cornerstone of T2DM treatment. Through physical activity, diabetic patients can achieve blood glucose control by directly expending energy. Exercise is also known to increase muscle mass, leading to sustained improvements in IS. Furthermore, it can improve blood lipid profiles, lower blood pressure, improve cardiovascular health, and elevate mood.

Combined Diet and Exercise Therapy:

In the DiRECT trial [9], 306 T2DM patients were randomized 1:1 to a weight management program or standard care. The intervention included a very low-energy diet (825–853 kcal/day) plus physical activity, followed by structured weight maintenance. At 12 months, 46% of the intervention group achieved remission vs. 4% of controls; at 24 months, 36% remained in remission vs. 3%.

Prescribing exercise:

See Table 3 for details.

Table 3. Exercise recommendations for weight loss of Type 2 Diabetes Mellitus remission.

Recommendation	Level of Evidence	Recommendation Grade
The effect of exercise on weight loss depends on the mode, intensity, duration, frequency, and total amount of exercise	3	C
We recommend the use of combined aerobic and resistance exercise to prevent and treat overweight or obesity	2a	B
Compared to diet or exercise alone, diet combined with exercise is more effective for weight loss	2a	B

Oral Hypoglycemic Agents and GLP-1 Receptor Agonist

Recommendation 6: For patients who do not meet HbA1c targets and cannot effectively implement intensive lifestyle interventions, short-term hypoglycemic drug treatment can help induce T2DM remission (Evidence Level Moderate (2a), Recommendation Level: B).

Dapagliflozin plus regular calorie restriction achieved a much higher rate of diabetes remission compared with calorie restriction alone in overweight or obese patients with T2DM [34]. In drug-naïve patients with T2DM, dorzagliatin treatment leads to stable glycemic control and drug-free diabetes remission. Improvements in β-cell function and TIR in these patients are important contributors to diabetes remission [35]. Following a short-term intervention with insulin glargine, sitagliptin/metformin, and lifestyle approaches, the number of T2DM participants remaining in remission was significantly higher in the intervention group at 36 weeks [36]. A 12-week intensive intervention comprising insulin glargine/lixisenatide, metformin, and lifestyle approaches can induce diabetes remission [37].

Recommendation 7: A brief course of weight reduction medications (12–24 weeks) is recommended as an adjunct to T2DM remission in individuals with a BMI ≥ 27 kg/m^2 (Evidence Level Moderate (2a), Recommendation Level: B).

Insulin

Recommendation 8: Adjunctive short-term (2-week) early insulin intensive therapy for patients with HbA1c ≥ 10% and FBG ≥ 11.1 mmol/L can assist in inducing remission of T2DM (Evidence Level Moderate (2a), Recommendation Level: B).

A multicenter randomized trial [14] in new-onset T2DM found that early intensive insulin therapy effectively restores/maintains β-cell function and achieves long-term glycemic remission.

Metabolic Surgery

Recommendation 9: For patients with a BMI ≥ 32.5 kg/m^2, if non-surgical treatments fail to significantly improve weight and metabolic disorders, clinicians may consider metabolic surgery as a treatment option for T2DM (Evidence Level High (1), Recommendation Level: A).

Metabolic surgery has been shown to have a substantial impact on T2DM. An analysis of 279 patients with T2DM and a BMI ≥ 50 kg/m^2 who underwent either Roux-En-Y gastric bypass (RYGB) or sleeve gastrectomy (SG) revealed that long-term T2DM remission (≥ 5 years) was achieved in 47% of patients. The duration of T2DM, the number of T2DM medications, and weight loss were identified as the only independent factors contributing to long-term T2DM remission [38]. The long-term effects of metabolic surgery have been observed, with remission rates of T2DM after surgery being 72.3% after 2 years and 30.4% after 15 years, both higher than that of the control group. These findings suggest that metabolic surgery offers a higher remission rate and fewer complications compared to conventional treatments [39]. Weight loss following bariatric surgery is strongly correlated with initial T2DM remission; however, beyond a threshold of 20% total weight loss, the rates of initial T2DM remission do not increase substantially [40].

Implementation of Clinical Pathways to Achieve T2DM Remission

The 5R Principles for T2DM Remission

1. Responsible: The primary care physician is the first point of contact and bears the initial responsibility for T2DM management, and is tasked with identifying, communicating, and arranging remission treatment for patients who meet the basic criteria for remission.
2. Review: A comprehensive patient assessment is necessary to evaluate the presence of remission conditions, potential medical risks, and to formulate plans and preventive measures for addressing medical risks during the remission process.
3. Reality: Tailor the remission goal and treatment plan to the patient's current disease status and healthcare resource availability. Patients unable to pursue a remission program should adhere to the conventional treatment plan recommended by the diabetes management guidelines.
4. Remission: The T2DM remission process encompasses professional assessment and screening, patient education and self-management training, and remission achievement through a multifaceted

approach involving diet, nutrition, exercise, medication, and metabolic surgery by professional teams.

5. Revisit: Regular follow-up is essential for patients undergoing remission therapy to assess the effectiveness of therapy, weight improvement and maintenance, adherence to a healthy lifestyle, clinical standard treatment requirements, and acceptance of conventional treatment and management as per the guidelines.

Implementation Considerations for Diverse Healthcare Settings

To improve global applicability, core recommendations are distinguished from context-dependent interventions:

1. Core universal strategies (applicable to all settings): basic lifestyle modification, weight control, simplified ABCD assessment;
2. Resource-dependent strategies (not mandatory in low- and middle-income settings): CGM, multidisciplinary teams, expensive drugs, metabolic surgery;
3. Adapted targets for resource-limited settings: moderate weight loss (5%–10%) instead of 15%+ weight loss, low-cost oral medications instead of injectables.

Establish an Interdisciplinary and Integrated Intervention Team

Recommendation 10: The establishment of a multidisciplinary team is essential for the implementation of T2DM remission strategies (Evidence Level Moderate (2a), Recommendation Level: B).

Evaluation of T2DM Remission Effect [17]

T2DM Remission Criteria

At least 3 months after discontinuation of glucose-lowering drugs or lifestyle intervention alone.

- HbA1c < 6.5%;
- When HbA1c is not a suitable indicator for blood glucose level evaluation: (a) FPG < 7.0 mmol/L; (b) eA1c < 6.5% from continuous glucose monitoring. Regular monitoring of HbA1c, FPG, or estimated eA1c using continuous glucose monitoring is necessary every three to six months after diabetes is confirmed to be in remission.

Other Evaluation Indicators [9]

1. BMI ≤ 24 kg/m^2, with a weight loss of ≥ 10 kg or ≥ 10%.
2. Reduction in body fat percentage to < 25% for men and < 30% for women.
3. Improvement in fatty liver status: resolution of ultrasound-detected fatty liver and normalization of liver function markers.
4. Muscle content should meet standards, with males at ≥ 40% and females at ≥ 35%.

Improved Prognosis for T2DM Remission

Recommendation 11: Maintaining long-term remission of diabetes significantly reduces the incidence of diabetes-related complications and all-cause mortality (Evidence Level Very Low (4), Recommendation Level: D).

The T2DM remission program outlined in this consensus may not eliminate the need for medication in all early-stage T2DM patients. Remission should be explicitly framed as conditional, time-dependent, reversible, and requiring lifelong surveillance. Clinicians should pay attention to distinguish carefully between remission, disease improvement, and cure.

Abbreviations

ADA: American Diabetes Association

CVD: cardiovascular disease

eA1c: estimated glycosylated hemoglobin

FBG: fasting blood glucose

FCP: fasting C-peptide

FPG: fasting plasma glucose

IR: insulin resistance

IS: insulin sensitivity

LCDs: low-carbohydrate diets

T2DM: Type 2 Diabetes Mellitus

TDR: total diet replacement

VLCDs: very low-carbohydrate diets

Declarations

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