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Ten-Hour Eating plus Fourteen-Hour Fasting Time-Restricted Eating in Weight Management among Overweight and Obese Populations: A Narrative Review

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Abstract: Traditional weight-loss strategies centered on continuous energy restriction are theoretically effective but often limited in real-world practice by the burden of meticulous dietary recording, poor adherence, and high rates of weight regain. Time-restricted eating (TRE), which modifies the temporal pattern of food intake rather than directly prescribing caloric intake, has emerged as a novel approach in obesity management. Among various TRE protocols, the 10-hour eating plus 14-hour fasting (10+14) regimen balances metabolic potential with behavioral feasibility and has therefore been widely applied in studies involving overweight and obese individuals. Current evidence suggests that 10+14 TRE alone generally produces modest weight loss and relatively stable improvements in waist circumference, visceral adiposity, and several cardiometabolic risk factors. When combined with high-intensity exercise, resistance training, or energy-restricted diets, however, the effects on body weight and body composition are markedly amplified. Limited follow-up data indicate that some individuals can transform a 10-hour eating window into a long-term lifestyle habit, thereby maintaining reductions in body fat and waist circumference over several years. Overall, the 10+14 regimen is better positioned as a foundational framework for long-term weight management and cardiometabolic risk control, rather than as a stand-alone tool for rapid weight reduction.

Keywords: Time-restricted Eating; 10-hour Eating Window; 14:10 Intermittent Fasting; Obesity; Body Composition; Metabolic Syndrome.

1. Introduction

Obesity and its related metabolic diseases have become major challenges in global public health. Traditional weight-management strategies based on continuous energy restriction are effective in theory but, in practice, often face substantial barriers, including poor adherence, weight cycling, and considerable psychological burden. With advances in chronobiology and nutritional timing, increasing attention has been paid to the impact of meal timing patterns on body weight and metabolic health. Time-restricted eating (TRE) has thus emerged in recent years as a key focus of obesity intervention research [1].

TRE is characterized by confining all daily caloric intake to a continuous eating window, while only water or non-caloric beverages are permitted outside this window. Common eating-window lengths include 4–6 hours, 6–8 hours, and 8–10 hours [1]. Unlike classical forms of intermittent fasting, TRE does not typically mandate strict caloric targets or specific food types. Instead, it aims to indirectly influence energy balance and metabolic rhythms by reducing eating occasions, limiting nighttime eating, and restructuring the relationship between eating and sleep. Systematic reviews and meta-analyses show that TRE is generally beneficial for reducing body weight, fat mass, and waist circumference; however, the magnitude of weight-loss effects varies considerably across protocols. Eating windows of 6–8 hours appear to offer the greatest fat-loss benefits, whereas 10–12-hour windows tend to produce smaller average weight reductions, with some trials failing to reach statistical significance [2].

Among the many specific TRE protocols, the 10-hour eating plus 14-hour fasting (10+14) regimen has attracted attention because it strikes a balance between metabolic challenge and day-to-day feasibility. On the one hand, a 14-hour fasting period is sufficient to cover nocturnal sleep and part of the waking period, thereby substantially extending the time during which the body remains in a low-insulin, fat-oxidation–dominant metabolic state. On the other hand, a 10-hour eating window can easily accommodate three main meals and small snacks, causing relatively little disruption to work and social routines [1,2]. Current randomized controlled trials and prospective studies indicate that the 10+14 regimen can induce modest weight loss and improvements in blood pressure, glycemia, and blood lipids in patients with metabolic syndrome, individuals at high risk of type 2 diabetes, and obese adults [3–6]. In patients with diabetes, a 14:10 schedule can also facilitate glycemic control and promote weight loss [7]. Early time-restricted eating studies suggest that, at comparable eating-window lengths, concentrating energy intake in the early daytime confers greater benefits for insulin sensitivity and blood pressure [8]. Among young adults with overweight, combining a 10-hour eating window with resistance training not only reduces fat mass but also maintains or increases lean mass [9]. Follow-up research further shows that some individuals spontaneously maintain TRE habits after completion of supervised interventions, thereby sustaining improvements in body fat and waist circumference over several years [10].

Against this background, a systematic synthesis of evidence on 10+14 TRE in weight management among overweight and obese populations is warranted. Such a review can clarify the magnitude of weight-loss effects, the underlying mechanisms, and the contexts in which this regimen is most applicable, providing guidance for future clinical trial design and practical implementation.

2. Conceptual Framework and Theoretical Basis of the 10+14 Regimen

The 10+14 protocol is a specific form of TRE in which all caloric intake within a 24-hour period is confined to a continuous window of approximately 10 hours, while the remaining 14 hours are fasting. Compared with more aggressive 4–6-hour eating windows, a 10-hour window imposes a moderate level of metabolic challenge but offers notable advantages in behavioral feasibility and long-term adherence [1,2].

From an energy-balance perspective, compressing the eating window generally reduces the number of eating occasions, particularly late-night snacks. Across multiple TRE trials, and even without explicit caloric prescriptions, daily energy intake often decreases spontaneously by about 10% (approximately 200–550 kcal/day), which over several months can accumulate to a 2–5 kg reduction in body weight [1,2].

From the standpoint of fuel utilization, a 14-hour fasting period substantially prolongs the time during which the body remains in a state of low insulin and limited exogenous glucose supply. Under these conditions, fatty acid mobilization and β-oxidation increase, ketone-body production rises, and nocturnal hepatic glucose output declines, thereby facilitating fat loss and improving mitochondrial function and oxidative-stress status [1]. For individuals with obesity, this cyclical shift among glucose, fat, and ketone utilization helps reduce insulin resistance and hepatic steatosis.

From a circadian perspective, chronic nighttime eating, irregular meal timing, and shift work can disrupt the alignment between central and peripheral clocks, increasing the risk of obesity and type 2 diabetes. By imposing clear boundaries on the eating window and reducing late-night intake, the 10+14 regimen promotes a "daytime eating, nighttime fasting" pattern. This in turn supports a more coherent alignment between the central circadian pacemaker and peripheral clocks in the liver, adipose tissue, and skeletal muscle [1]. Early TRE studies demonstrate that, even when total energy intake and weight-loss magnitude are similar, concentrating food intake in the early part of the day yields greater improvements in insulin sensitivity and blood pressure [8]. This suggests that, even when the eating-window duration is fixed at 10 hours, the start and end times are themselves critical determinants of metabolic outcomes.

Systematic reviews also indicate that TRE, while generally effective in reducing fat mass and waist circumference, can be accompanied by small decreases in lean mass and slight increases in LDL cholesterol. This pattern implies that, under energy deficit conditions, inadequate protein intake and lack of resistance training may compromise the quality of weight loss [2]. In randomized controlled trials involving young adults with overweight, a 10-hour eating window alone was indeed associated with losses in lean mass, whereas combining TRE with resistance training markedly attenuated this adverse change [9]. Consequently, in practical application, the 10+14 regimen often needs to be combined with appropriate dietary composition and exercise prescriptions to maximize fat loss while preserving or enhancing lean mass.

3. Weight-Management Effects of the 10+14 Regimen in Different Populations

3.1. Patients with Metabolic Syndrome

In individuals with metabolic syndrome, the 10-hour eating window was initially implemented in the form of single-arm pre–post intervention studies. Wilkinson and colleagues enrolled 19 patients with metabolic syndrome in a 12-week intervention, in which baseline daily eating duration commonly exceeded 14 hours [3]. Participants were instructed to restrict all caloric intake to a self-selected 10-hour window without changing medication regimens or the qualitative composition of the diet. At the end of the intervention, mean body weight decreased by approximately 3%, with significant reductions in waist circumference and fat mass, as well as marked decreases in systolic and diastolic blood pressure. Atherogenic lipid parameters, such as non-HDL cholesterol, also improved significantly [3]. Fasting glucose and HbA1c displayed downward trends, and the number of metabolic syndrome components was reduced in some participants.

These findings indicate that, among patients with metabolic syndrome, a 10-hour eating window can exert an additive effect on weight loss and blood pressure control without the need to increase medication load or impose strict dietary changes. Although the absence of a control group limits causal inference, this signal-generating study provided an important foundation for subsequent randomized controlled trials in high-risk metabolic populations.

3.2. Individuals at High Risk of Type 2 Diabetes and Patients with Diabetes

The RESET trial evaluated the effects of a 10-hour TRE regimen using a more rigorous randomized design in individuals at high risk of type 2 diabetes [5]. The study enrolled 100 Danish adults who met criteria for overweight/obesity plus impaired fasting glucose or impaired glucose tolerance. Participants in the intervention group were instructed to confine eating to a self-selected 10-hour window for three months, while the control group maintained their usual eating schedule; diet composition and daily activity levels were not strictly controlled. In intention-to-treat analyses, between-group differences in body weight and several cardiometabolic outcomes were modest, with an average weight difference of about 0.8–1.0 kg. Per-protocol analyses revealed that participants with high adherence to the 10-hour window lost approximately 1 kg more than controls at three months, reaching statistical significance. However, this difference diminished during the subsequent three-month follow-up [5]. Overall, a 10-hour eating window produced mild weight loss and limited cardiometabolic improvements in this high-risk population, suggesting that the regimen is better positioned as part of long-term risk management rather than as a primary short-term weight-loss strategy.

In obese patients with type 2 diabetes, a randomized controlled trial by Sukkriang and colleagues highlighted the potential of the 14:10 protocol from another angle [7]. Ninety-nine adults with obesity and T2DM were randomized to 16:8, 14:10, or usual-diet control groups. Participants in the two intermittent fasting groups implemented the assigned protocol three days per week for three months. Both IF regimens produced significantly greater weight loss than the

control group: the 16:8 group lost 4.02% and the 14:10 group 3.15% of baseline body weight, whereas the control group lost only 0.55%. Both IF regimens significantly improved HbA1c, fasting glucose, and blood lipid profiles. Although 16:8 resulted in slightly greater weight loss than 14:10, its advantage in certain metabolic markers was not pronounced [7]. These findings suggest that, in T2DM patients who require a balance between glycemic control and intervention feasibility, a 14:10 schedule is a practical and metabolically beneficial option.

3.3. Obese and Overweight Adults

Among obese and overweight adults, the effectiveness of the 10+14 regimen is strongly influenced by concomitant lifestyle interventions. In a virtual randomized controlled trial, Peeke and colleagues recruited adults with a BMI ≥ 30 kg/m² into a commercial weight-loss program in which all participants received standardized low-energy diet prescriptions, exercise guidance, and online behavioral support, then were randomized to a 14:10 TRE group or a 12:12 group [6]. After eight weeks, the two groups achieved substantial and clinically meaningful weight loss of approximately 8.5% and 7.1%, respectively. The 14:10 group showed slightly greater reductions in body weight and fasting glucose compared with the 12:12 group, although the differences were not large [6]. In this context, the 14:10 protocol functions more as a refinement of temporal eating structure layered upon an intensive lifestyle intervention, rather than as the primary driver of weight-loss magnitude.

Jamshed and colleagues compared an early 8-hour TRE regimen with a traditional calorie-restricted diet. Although the eating window in their trial was shorter than 10 hours, the findings are informative for understanding 10+14 protocols [8]. Under conditions of comparable energy intake and weight loss, early 8-hour TRE resulted in greater improvements in insulin sensitivity, blood pressure, and oxidative stress markers. These results underscore the importance of the circadian timing of food intake as a key determinant of metabolic outcomes, independent of total calories. By extension, positioning a 10-hour eating window in the early–mid daytime, rather than the late–night period, may further enhance weight and metabolic benefits without substantially compromising real-world feasibility.

4. Combined Interventions: 10+14 with Exercise and Energy Restriction

When implemented alone, the 10+14 regimen typically yields modest weight loss, whereas its combination with exercise training or energy-restricted diets tends to produce more pronounced improvements in body weight and body composition.

In the TREHIIT trial, Haganes and colleagues randomized 131 women with overweight or obesity to four groups: 10-hour TRE, high-intensity interval training (HIIT) only, combined TRE+HIIT, and control, with a 7-week intervention [4]. Both TRE alone and HIIT alone significantly reduced total fat mass and visceral adipose tissue. However, the combined TRE+HIIT group demonstrated superior improvements in fat mass and HbA1c, despite only modest overall weight loss; changes in body composition were particularly marked [4]. These findings suggest that, in women with overweight, a 10-hour eating window and high-intensity exercise have synergistic effects, preferentially reducing visceral fat and improving glycemic control.

Cui and colleagues further tested the benefits of combining a 10-hour eating window with resistance training in young adults with overweight [9]. Using a four-arm parallel design (control, TRE, resistance training [RT], and TRE+RT), they implemented an 8-week intervention. The TRE-only group exhibited reductions in body weight and BMI but also a decrease in lean mass. The RT-only group achieved significant reductions in fat mass and increases in lean mass without notable changes in body weight. The combined TRE+RT group achieved the greatest reductions in total fat mass and visceral adipose tissue while maintaining or increasing lean mass; waist and hip circumferences decreased most prominently in this group, and sleep quality and mood also tended to improve [9].

From an energy-balance perspective, TRE generates a moderate energy deficit by restricting eating opportunities, whereas exercise training increases energy expenditure; together, they facilitate a larger negative energy balance. From a metabolic-restructuring perspective, extended nocturnal fasting promotes fat mobilization, while high-intensity or resistance exercise stimulates muscle protein synthesis and mitochondrial biogenesis, directing the energy deficit primarily toward fat loss rather than lean tissue loss [1,4,9]. Thus, within combined interventions, the 10+14 regimen is best conceptualized as providing a stable temporal and circadian framework within which dietary and exercise prescriptions operate.

After completing the TREHIIT trial, Haganes and colleagues conducted a two-year follow-up to examine the persistence of TRE and HIIT behaviors in real-world settings [10]. Approximately half of the participants maintained TRE or HIIT at varying frequencies, and those who consistently adhered to TRE still exhibited lower levels of body fat and waist circumference compared with less adherent individuals. Although the small sample size and reliance on self-reported adherence limit the strength of the evidence, these data suggest that a supervised 10-hour eating-window habit can, for some individuals, be transformed into a long-term lifestyle pattern, maintaining weight and body-fat benefits over a multi-year horizon.

5. Metabolic Mechanisms and Potential Mediators

Synthesizing current trials and reviews, the weight-loss and metabolic effects of the 10+14 regimen likely arise from multiple interwoven pathways.

First, spontaneous reductions in energy intake. Without explicit caloric prescriptions, TRE typically decreases eating occasions and late-night snacking, leading to a spontaneous reduction of about 10% in daily energy intake. Over a three-month period, this “hidden” energy deficit may translate into a 2–4 kg reduction in body weight [1–3].

Second, changes in nocturnal fuel utilization. A 14-hour fasting window extends the duration of low-insulin physiology, promoting fatty acid mobilization, β-oxidation, and ketone-body production while reducing hepatic glucose output during the night [1,8]. This cyclical shift among glucose, fat, and ketone utilization not only drives fat loss but may also improve mitochondrial function and oxidative-stress status, thereby lowering insulin resistance and ameliorating fatty liver.

Third, restructuring of circadian and behavioral rhythms. Chronic late-night eating and irregular meal timing misalign central and peripheral clocks, increasing the risk of obesity and type 2 diabetes. By limiting late-night caloric intake, the 10+14 regimen sharpens the alignment between eating and sleep, facilitating resynchronization of central circadian signals with peripheral clocks in the liver, adipose tissue, and skeletal muscle [1]. Early TRE studies show that, even with comparable weight loss, concentrating food intake in the early daytime produces greater improvements in insulin sensitivity and blood pressure [8], likely because the meal pattern is better synchronized with circadian rhythms.

Fourth, modulation of gut microbiota and neuroendocrine regulation. Some studies suggest that TRE can alter the composition and diurnal oscillation of the gut microbiota, promoting the rhythmic release of short-chain fatty acids and other metabolites, which in turn influence satiety, energy intake, and insulin sensitivity [1,2]. Time-restricted eating may also reshape leptin and ghrelin dynamics, along with sympathetic–parasympathetic balance, thereby adjusting the drive to eat and the pattern of energy expenditure.

At the same time, meta-analytic data show that, although TRE is generally favorable for reductions in fat mass and waist circumference, it may be accompanied by small decreases in lean mass and slight increases in LDL cholesterol [2]. In young adults, trials using a 10-hour eating window alone have observed declines in lean mass, whereas combining TRE with resistance training substantially mitigates this adverse effect [9]. Therefore, when applying the 10+14 regimen, particular attention should be paid to adequate protein intake and structured resistance training to avoid "trading" lean mass for weight loss.

6. Limitations and Interindividual Variability in Application

Available studies indicate marked heterogeneity in responses to the 10+14 regimen across different populations. Some patients with metabolic syndrome or at high risk of type 2 diabetes show clear improvements in body weight and metabolic parameters, whereas others experience only modest or non-significant changes [3,5,7]. Such variability may relate to baseline degrees of circadian disruption, visceral fat burden, β-cell reserve, work-shift patterns, sleep duration, and individual tolerance of hunger, among other factors.

In terms of safety, most studies report good tolerability of the 10+14 regimen, with serious adverse events being rare. Common transient side effects include mild dizziness, fatigue, or mood fluctuations during the early phase of intervention, which typically resolve after an adaptation period [1–3,5–7,9,10]. For patients with type 2 diabetes who are using insulin or sulfonylureas, medical supervision is necessary to adjust medication dosage and meal timing in order to reduce the risk of hypoglycemia. For pregnant or lactating women and individuals with a history of eating disorders, current evidence is limited, and the 10+14 regimen should not be routinely recommended.

Regarding long-term maintenance, follow-up data from the TREHIIT trial suggest that roughly half of participants continued to practice TRE or HIIT at varying frequencies two years after the supervised intervention. Those who maintained TRE behavior generally preserved lower levels of body fat and waist circumference [10]. Although these findings must be interpreted cautiously due to sample size and adherence-assessment limitations, they nonetheless hint at the potential for a 10-hour eating window to evolve into a stable, long-term behavioral pattern in a subset of individuals.

7. Research Gaps and Future Directions

Current research on the 10+14 regimen exhibits multiple limitations in terms of evidence hierarchy, study design, and population coverage. First, the duration of interventions and follow-up in most trials is relatively short, often no longer than three to six months. As a result, critical questions about whether the 10+14 regimen can sustain long-term weight loss or reduce the incidence of cardiovascular events remain unanswered. Future trials in high-risk populations should employ longer follow-up periods and use weight-maintenance rates, cardiovascular outcomes, and quality of life as primary endpoints to comprehensively evaluate the long-term benefits and risks of 10+14 TRE.

Second, the interaction between the circadian placement and duration of the eating window is not well understood. Existing evidence suggests that early TRE confers advantages in metabolic improvement, yet trials directly comparing "early 10-hour" versus "freely chosen 10-hour" windows within the same eating-window length are lacking. Future research should systematically explore the effects of different start and end times for a 10-hour window—under conditions of acceptable adherence—on body weight, body composition, and metabolic outcomes, thereby providing more refined temporal prescriptions for clinical practice.

Third, the mechanistic basis of interindividual variability remains underexplored. Current studies predominantly focus on average treatment effects and seldom conduct structured comparisons between high responders and low responders. Integrating metabolomics, gut microbiome profiling, wearable-device data, and detailed dietary-behavior assessments may facilitate the construction of multidimensional "time–metabolism–behavior" phenotypes, enabling identification of individuals most likely to benefit from the 10+14 regimen and informing personalized TRE prescriptions.

Fourth, there is no consensus on the optimal combination of macronutrient composition and exercise modalities. Variations in protein intake, fat and carbohydrate proportions, and the balance between aerobic and resistance exercise can all influence weight-loss quality and metabolic outcomes under the 10+14 regimen. Multifactorial intervention studies comparing different "timing–nutrition–exercise" combinations are therefore needed to build a more comprehensive, integrative framework for obesity management.

8. Conclusion

Overall, a 10-hour eating plus 14-hour fasting time-restricted eating regimen generally produces modest weight loss in overweight and obese populations, accompanied by relatively stable improvements in waist circumference, visceral adiposity, and several cardiometabolic risk factors. When used as a stand-alone strategy, the 10+14 regimen has limited weight-loss potency and is best viewed as a long-term framework that emphasizes behavioral feasibility and metabolic safety. When combined with energy restriction, high-intensity interval training, or resistance training,

however, both the magnitude of weight loss and the quality of body-composition changes are substantially enhanced.

In practical application, the 10+14 protocol can be adapted to different levels of metabolic risk, work patterns, and lifestyle preferences. For individuals with metabolic syndrome or at high risk of type 2 diabetes, it can serve as a useful adjunct to pharmacotherapy and traditional lifestyle modifications. For patients with obesity who require more substantial weight loss, 10+14 TRE is likely to be most effective when integrated with structured, energy-restricted diets and tailored exercise programs. With continued refinement of the evidence base, optimization of individualized prescriptions, and strengthening of long-term follow-up, the 10+14 regimen may help achieve a more favorable balance among weight control, metabolic improvement, and quality-of-life enhancement.

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