RSSDI Indian Diabetes

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Theme of the Month

Nutritional Advances in Diabetes

To keep Members of Diabetes Care team abreast about DSME/DSMS - (Diabetes Self management Education/Support) Concepts

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*DSME: Diabetes Self-Management Education, DSMS: Diabetes Self-Management Support

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FOREWORD

Research Society for the Study of Diabetes in India (RSSDI) founded by Prof. MMS Ahuja in the year 1972 is the biggest scientific association of healthcare professionals involved in promoting diabetes education and research in India. RSSDI is happy to collaborate with USV to support their endeavour to make India the 'Diabetes care capital of the world'. Through this collaboration, RSSDI would like to strengthen the cadre of diabetes educators by empowering them with recent updates in diabetes management helping bridge the gap between the physician and the patient. Today, the rule of 50% is prevailing in terms of awareness, detection, treatment and control in T2DM. Our aspiration is to achieve 90-90-90-90 i.e.90% of people with diabetes should be made aware, 90% should be detected, 90% of those detected should be treated, and 90% of those treated should reach their goals.

Indian Diabetes Educator Journal (IDEJ) is the first of its kind in India, and the longest running monthly diabetes educator journal since April 2015 and continues its endeavour to spread awareness, knowledge and enable healthcare teams to manage individuals with diabetes and empower them for self-care. RSSDI IDEJ will continue to keep the members of diabetes care team abreast with concepts of Diabetes Self-Management Education/Support (DSME/S) with a reach of 44000 doctors and diabetes educators digitally.

Medical nutrition therapy is an important pillar in diabetes management. This issue of IDEJ provides invaluable insights, evidence-based dietary recommendations, and the latest advances in nutritional research for better glucose control. We hope that with this information, diabetes educators can empower their patients to manage their condition effectively and improve their quality of life.

We sincerely thank our contributors for making this issue delightful reading for our readers. We dedicate this journal to all the healthcare professionals who are working relentlessly towards making "India–The Diabetes Care Capital of the World."

Sincere Regards,

Dr. Sanjay Agarwal
RSSDI Secretary

*DSME: Diabetes Self-Management Education, DSMS: Diabetes Self-Management Support

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Article: Efficacy of Dietary Approaches to Stop Hypertension (DASH) Diet in Diabetes

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Article: Frequently Asked Questions on Nutritional Advances in Diabetes

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Medical Nutrition Therapy (MNT) plays a crucial role in the comprehensive management of diabetes. The American Diabetes Association (ADA) recently released its updated Standards of Care for 2024, which includes the latest evidence-based recommendations for MNT in diabetes.

These recommendations aim to provide healthcare professionals with guidance on designing individualized meal plans that support optimal glycemic control, weight management, and overall health in individuals with diabetes.

Effectiveness of nutrition therapy

The ADA strongly recommends that all individuals with type 1 or type 2 diabetes, prediabetes, and gestational diabetes mellitus receive an individualized MNT program provided by a qualified/registered dietitian with expertise in diabetes care. This recommendation is based on substantial evidence demonstrating that MNT delivered by a qualified dietitian can significantly improve glycemic control, with reported glycated hemoglobin (A1C) reductions of 1.0–1.9% for individuals with type 1 diabetes and 0.3–2.0% for those with type 2 diabetes.

Energy balance and weight management

For individuals who are overweight or obese, the ADA recommends behavioral modification strategies aimed at achieving and maintaining a minimum weight loss of 5%. This recommendation is supported by evidence indicating that modest, sustained weight loss can delay the progression from prediabetes to type 2 diabetes and improve glycemic control in individuals with existing type 2 diabetes.

Eating patterns and macronutrient distribution

The ADA emphasizes the importance of individualizing meal plans based on nutrient quality, total calorie intake, and metabolic goals, as there is no single macronutrient distribution that fits all individuals. However, the guidelines recommend food-based dietary patterns that emphasize the inclusion of non-starchy vegetables, whole fruits, legumes, whole grains, nuts/seeds, and low-fat dairy products while minimizing the consumption of refined grains, sugar-sweetened beverages, sweets, and ultra-processed foods.

Carbohydrate recommendations

The ADA recommends emphasizing minimally processed, nutrient-dense, high-fiber sources of carbohydrates (at least 14 grams of fiber per 1,000 kcal). The diabetes India 'decode fiber' expert consensus recommends 25–40 g fiber intake daily for individuals with diabetes. Additionally, individuals with diabetes are advised to replace sugar-sweetened beverages, including fruit juices, with water or low-calorie or no-calorie beverages as much as possible.

Protein and dietary fat

Protein aids in diabetes management by increasing satiety and lowering the glycemic index (GI) of a meal. Additionally, replacing animal protein with plant protein may improve glycemic control and lower cardiovascular risk. Furthermore, the ADA recommends counseling individuals with diabetes to consider an eating plan that emphasizes elements of a Mediterranean eating pattern, rich in monounsaturated and polyunsaturated fats and long-chain fatty acids to reduce cardiovascular disease risk and improve glucose metabolism.

Supplementation of micronutrients

The ADA does not recommend dietary supplementation with vitamins, minerals, herbs, or spices for glycemic benefits. However, the guidelines caution against beta-carotene supplementation due to evidence of harm for certain individuals and lack of benefit.

Sodium intake

The ADA recommends counseling individuals with diabetes to limit sodium consumption to less than 2,300 mg/day. This recommendation aligns with the Research Society for the Study of Diabetes in India (RSSDI) and aims to reduce the risk of cardiovascular disease and hypertension in individuals with diabetes.

Overall, the ADA's latest MNT recommendations emphasize the importance of individualized meal planning. They emphasize nutrient-dense, minimally processed foods while considering personal preferences, health literacy, and access to healthful foods. By following these evidence-based guidelines, healthcare professionals can support individuals with diabetes in achieving optimal glycemic control, managing weight, and reducing the risk of diabetes-related complications.

Key points

- The ADA's latest MNT recommendations stress personalized plans from diabetes-specialized dietitians, improving glycemic control with A1C reductions.
- Weight loss of 5% targets delaying prediabetes progression and improving type 2 diabetes management.
- Prioritize nutrient-rich foods, limit refined carbohydrates and sugary drinks, opt for high-fiber carbohydrates, and replace sugary drinks with water.
- It is advisable to adopt a Mediterranean-style diet for heart health.
- Avoid unnecessary supplements, educate on alcohol's effects, and limit sodium intake to < 2,300 mg/day for cardiovascular health.
- Tailored nutrition strategies are crucial for optimal glycemic control and reducing diabetes-related risks.

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Intermittent Fasting in Diabetes: Benefits and Risks

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Intermittent fasting (IF) has gained popularity as a dietary practice for its potential health benefits, including weight loss and improved metabolic health. For individuals with diabetes mellitus (DM), IF may offer some benefits but also comes with risks that require careful monitoring.

Understanding IF

IF involves alternating periods of eating and fasting.

Table 1: Common types of IF

Periodic fasting	Fasting for up to 24 hours once or twice a week.
Time-restricted feeding	Eating within a specific window, such as 8 hours, and fasting for the remaining 16 hours.
Alternate-day fasting	Fasting every other day, with ad libitum eating on non-fasting days.
The 5:2 diet	Consuming a very low-calorie diet on two non-consecutive days of the week, with normal eating on the other days.

Abbreviation: IF: Intermittent fasting

Benefits of IF for diabetes

1. **Improved glycemic control:** IF can lead to significant improvements in blood glucose levels and insulin sensitivity. Studies have shown that IF can reduce hemoglobin A1C (HbA1c) levels, a marker of long-term glycemic control, by up to 3% over several months.
2. **Weight loss:** IF typically results in a calorie deficit, leading to weight loss, which is crucial for managing type 2 diabetes mellitus (T2DM). Weight loss improves insulin sensitivity and glycemic control.
3. **Reduced insulin resistance:** By improving insulin sensitivity, IF helps in better management of blood glucose levels. It helps reduce insulin resistance by aiding in weight loss and visceral fat loss.
4. **Gut health:** IF may lead to beneficial changes in the gut microbiome, enhancing metabolic health and reducing inflammation.

Risks and considerations

1. **Hypoglycemia:** People with diabetes, especially those on insulin or certain oral antidiabetic medications (sulphonylureas), are at risk of low blood glucose levels during fasting periods. Regular monitoring of blood glucose levels and regulating medication dosage/type or timing by a healthcare professional is essential during fasting.
2. **Cardiovascular risk:** According to the American Heart Association, eight hours of time-restricted eating is associated with a 91% increased risk of cardiovascular death.
3. **Dehydration:** Fasting periods may increase the risk of dehydration, which can be exacerbated in individuals with diabetes.
4. **Nutritional deficiencies:** Prolonged fasting without proper nutritional planning can lead to deficiencies in essential nutrients.
5. **Other side effects:** Common side effects, such as headaches, fatigue, dizziness, and difficulty concentrating, may occur, especially early on.
6. **Not suitable for all:** IF may not be appropriate for all individuals with diabetes, such as pregnant women, older adults, or those with health conditions that could be worsened by fasting.

While IF shows promise for helping manage diabetes, it's crucial that individuals with diabetes work closely with their healthcare team before attempting any IF regimen. Medication dosages may need adjustment, and careful blood glucose monitoring is essential to avoid potential side effects like hypoglycemia. More long-term, high-quality research is still needed on the safety and efficacy of IF, specifically for diabetes management. However, for some individuals with prediabetes or type 2 diabetes who are overweight, adding IF could be a reasonable component of an overall healthy lifestyle program with proper guidance.

Key points

- IF offers potential benefits for diabetes management, including improved glycemic control, weight loss, reduced insulin resistance, and enhanced gut health.
- Common IF methods include periodic fasting, time-restricted feeding, alternate-day fasting, and the 5:2 diet.
- Despite its benefits, IF carries risks such as hypoglycemia, dehydration, nutritional deficiencies, and an increased risk of cardiovascular death associated with certain fasting regimens, as well as other side effects like headaches and fatigue.
- It may not be suitable for everyone, particularly pregnant women, older adults, or those with other health conditions.
- Close monitoring and guidance from healthcare professionals are essential for individuals with diabetes considering IF.
- More long-term research is needed to fully understand the safety and efficacy of IF in diabetes management.

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Alternative Dietary Approaches in Type 2 Diabetes Mellitus: Mediterranean, Plant-Based Diets, Paleolithic Diet

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Type 2 diabetes mellitus (T2DM) is a chronic metabolic disorder characterized by insulin resistance and impaired insulin secretion. According to the International Diabetes Federation (IDF) Diabetes Atlas (2021), 10.5% of the adult population (20–79 years) in the world have diabetes. India accounts for 1 in 7 of all adults living with diabetes worldwide. Dietary interventions play a pivotal role in the management of T2DM. However, traditional dietary recommendations often focus on macronutrient composition and caloric restriction. In recent years, alternative dietary approaches have gained attention for their potential benefits in managing T2DM.

The Mediterranean diet and T2DM

The Mediterranean diet can be defined by an increased consumption of unrefined cereals, vegetables, legumes, fruits, nuts, and olive oil, a minimal amount of saturated fat, a moderately high intake of fish, a low-to-moderate intake of dairy products (cheese or yogurt), eggs, and poultry, and a low intake of red meat. Research shows that people with T2DM can benefit greatly from a low-fat or low-carb diet combined with a Mediterranean lifestyle. A study examining the prevention of type 2 diabetes found that the Mediterranean diet reduced the relative risk by 30% compared to the low-fat diet. Another study showed lower fasting glucose in the calorie-restricted Mediterranean diet group compared to the calorie-restricted, low-fat, and calorie-restricted, very low-carb diet group. In a four-year study, the Mediterranean diet was compared to a low-fat diet, showing improved glycemic profile and reduced need for hypoglycemic medications with the former. Another study found that a Mediterranean diet supplemented with olive oil and nuts significantly lowered the incidence of cardiovascular disease (CVD) risk in T2DM patients. This dietary pattern has also shown high long-term adherence and hence can be a sustainable option.

A plant-based diet and T2DM

Research has demonstrated the advantages of plant-based diets in treating T2DM and reducing macro and microvascular complications. These diets are usually high in fiber and phytonutrients and lower in saturated fat. In several randomized trials, plant-based interventions for people with T2DM have led to greater weight loss as compared to animal-based control diets, with a major portion attributed to a decrease in visceral fat, crucial for reducing insulin resistance and inflammation. A meta-analysis comparing vegetarian interventions with control diets demonstrated significant improvements in CVD risk factors, including lipid profile, blood pressure, glycemic response, body weight, and abdominal adiposity.

The Paleolithic diet and T2DM

The Paleolithic diet, or hunter-gatherer diet, reflects the eating habits of people from the Paleolithic era. It emphasizes meat, fish, eggs, vegetables, fruits, roots, and nuts while excluding dairy, oils, grains, legumes, salt, and refined sugars. A meta-analysis showed that although the Paleolithic diet led to a decrease in fasting blood glucose levels, there were no significant differences between the effects of the Paleolithic diet and control diets on fasting glucose levels. On the other hand, several studies have demonstrated that Paleolithic nutrition is more effective for weight loss as compared to a control diet, which is mainly attributed to increased satiety levels due to high protein content. However, the majority of the studies concluded that the Paleolithic diet did not differ from other types of commonly perceived healthy diets with regard to effects on glucose and insulin homeostasis in people with impaired glucose metabolism. Additionally, due to challenges like raw meat consumption and food contamination risks, the use of the Paleolithic diet in managing T2DM is limited.

In summary, alternative dietary approaches hold promise for managing T2DM. The Mediterranean diet and plant-based diets offer potential benefits in improving glycemic control and reducing cardiovascular risk factors. However, the practicality and safety concerns of the Paleolithic diet limit its recommendations for managing T2DM. As research progresses, tailored dietary interventions are essential for effective and sustainable T2DM management.

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Superfoods for the Management of Type 2 Diabetes

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A major pillar for managing type 2 diabetes is medical nutrition therapy (MNT). This includes estimating energy and nutrient requirements, measuring carbohydrates, calculating glycemic index and glycemic load, recommending adequate and good-quality dietary fats and protein intake, and providing general recommendations for a healthy diet. For better glycemic management, the administration of a variety of superfoods has also been suggested. Although there is no agreed-upon definition, the phrase "superfood" is generally used to promote foods with substantial health advantages, i.e., foods that can prevent diseases and improve general health.

Table 2: Superfoods beneficial in the management of T2DM

Plant name	Plants parts	Recommended dosage	Benefits for diabetes
Dill (*Anethum graveolens* L.)	Stem, leaves, and seeds are used	3 g/d	Reduces AGEs, blood glucose, fructosamine levels, inflammatory cytokines, protein glycation, triglycerides, total cholesterol, LDL-C, and VLDL-C
Methi seeds (*Trigonella foenum-graecum* L.)	Seeds are mainly used	10 g of seeds/d	Increases insulin secretion, lowers cholesterol and blood glucose
Garlic (*Allium sativum* L.)	Pulp from garlic cloves	0.05–1.5 g/d	Lowers blood glucose and intestinal glucose absorption, lowers total cholesterol and oxidative stress, and improves HDL
Ceylon cinnamon (*Cinnamomum verum*)	Usually, dried bark (inner part) is used	3–6 g/d	Decreases AGE formation, increases insulin sensitivity and response, improves glucose absorption and glycogen synthesis, decreases gluconeogenesis, and increases phosphorylation
Cumin seeds (*Cuminum cyminum* L.)	Commonly, seeds are used	500 mg/d (powder)	Decreases α-amylase and α-glucosidase activity, lowers blood glucose and glycosylated hemoglobin, reduces body weight, lowers cholesterol, decreases free fatty acid, decreases triglycerides, and improves insulin secretion

Table 2: Superfoods beneficial in the management of T2DM (Table contd...)

Plant name	Plants parts	Recommended dosage	Benefits for diabetes
Ginger (*Zingiber officinale* Roscoe)	Generally, roots and rhizomes are commonly used	1.8 g/d	Decreases α-glucosidase and α-amylase activity, improves insulin sensitivity, lowers cholesterol levels, decreases serum glucose, lowers triglyceride, and improves HDL cholesterol
Barley (*Hordeum vulgare* L.)	Leaves, sprouts, and grains are commonly used	4.7 g β-glucan (100 g barley)	Lowers blood glucose levels, lowers cholesterol, increases α-glucosidase and α-amylase, and improves insulin secretion

Abbreviations: T2DM: Type 2 diabetes mellitus; AGEs: Advanced glycation end products; LDL-C: Low-density lipoprotein cholesterol; VLDL-C: Very-low-density lipoprotein cholesterol; HDL: High-density lipoprotein

While there's ongoing research into the potential benefits of herbs and plant-based foods for diabetes management, focusing on a balanced, whole-foods-based diet remains the foundation of dietary therapy. Integrating the therapeutic and medicinal properties of foods as part of a comprehensive nutrition plan can indeed enhance the effectiveness of dietary management for type 2 diabetes.

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Interview with Ms. Sheryl Salis

Ms. Sheryl Salis

Registered Dietitian, Certified Diabetes Educator, Certified Insulin Pump Trainer, Certified Sports Nutritionist - USA, FODMAP Dietitian - Australia, Certified Onco-Nutritionist, Founder of Nurture Health Solutions, Mumbai

Ms. Sheryl Salis is the Founder and Director of Nurture Health Solutions and a highly accomplished Registered Clinical and Sports Dietitian, Naturopath, Certified Diabetes Educator, fermentable oligosaccharides, disaccharides, monosaccharides and polyols (FODMAP) Dietitian, Certified Insulin Pump Trainer, and Author. With over 24 years of experience in dietetics and diabetes education, she has earned top ranks in post-graduation and registered dietitian (RD) exams. An International Society for Pediatric and Adolescent Diabetes (ISPAD) Advisory Council member and leader of its Special Interest Group in Nutrition, Ms. Sheryl received the prestigious Allan Drash Fellowship in 2021. She has authored the award-winning book "Diet in Diabetes Simplified" and co-authored the ISPAD 2022 nutrition guidelines for type 1 diabetes. Sheryl's contributions to education are extensive, serving as a course director, visiting faculty, and trainer. Her accolades include the India Association for Parenteral and Enteral Nutrition (IAPEN) National Award and Mahila Vikas Mandal Vigyan Puraskar, among others. A sought-after speaker and media expert, she frequently presents at conferences and publishes in peer-reviewed journals. She has authored influential patient education books and contributed chapters to medical textbooks.

Nutritional Advances in Diabetes

1. What are some recent breakthroughs or advances in nutritional therapy for diabetes management?

Ans. There is a lot of ongoing research that is helping shape our understanding of medical nutrition therapy (MNT) in diabetes management. Here are some recent advances in MNT for diabetes management.

The American Diabetes Association (ADA) guidelines emphasize that no one size fits all. There is no such thing as a "diabetic diet," and MNT must be personalized to help individuals attain optimal nutrition levels, enhance health status, achieve and maintain metabolic targets (body weight, blood glucose, blood lipids, and blood pressure), prevent short- and long-term diabetes complications, and improve quality of life.

The emphasis must be on healthy eating patterns that take into account personal and cultural preferences. There is no single ideal dietary distribution of calories among carbohydrates, fats, and proteins for people with diabetes, and macronutrient distribution should be tailored and customized to individual needs while keeping total calorie and metabolic goals in mind.

Reducing overall carbohydrate intake, with emphasis on nutrient quality and choosing foods with low glycemic index and glycemic load, has shown the most evidence of improving glycemic control. This can be used in a number of eating patterns to match individual needs and preferences. Portion control is key, with a focus on “nutrient density” and “diet diversity.”

From the food pyramid, we have transitioned to the "healthy eating plate." The ADA suggests using a 9" plate instead of a 12" plate. The Joslin healthy eating plate recommends filling half the plate with non-starchy vegetables and salads, ¼th with unpolished cereals, millets, and starchy vegetables, and the remaining ¼th with protein-rich food sources. Choosing a range of food groups will help provide all the essential macro and micronutrients, ensure nutrient adequacy, and help improve satiety while helping achieve glycemic targets.

The order in which one consumes food also influences post-meal blood glucose levels. Several studies have demonstrated that meal sequencing (eating fiber, protein, and healthy fat-containing foods first, followed by carbohydrates or starch-rich foods) helps improve post-meal glycemic response.

There is also strong evidence that gut dysbiosis is associated with changes in glucose homeostasis. The *Firmicutes/Bacteroidetes* ratio is seen to be altered in individuals with type 2 diabetes, thus implying the role of gut dysbiosis in the development of diabetes. Maintaining a healthy gut microbiota by including pre and probiotic foods coupled with a healthy lifestyle can play a pivotal role in preventing type 2 diabetes and its associated complications.

Recent scientific studies have demonstrated that remission of type 2 diabetes/prediabetes can be achieved in those who reduce their energy intake to less than 800 calories under strict medical guidance and supervision of a trained nutritionist and physician. The primary driver and predictor of diabetes remission is weight loss (usually 15 kg or more) and maintenance. It is essential to have ongoing support and monitoring from a medical team in order to avoid regaining weight and relapse of diabetes remission.

Rather than a one-size-fits-all approach, artificial intelligence (AI)-powered personalized nutrition is becoming the game changer, moving away from generic suggestions towards tailored approaches based on individual requirements. AI-powered tools aid in data assessment and genetic analysis in order to identify nutritional imbalances, monitor progress, provide instant feedback, fine-tune, and generate personalized dietary recommendations. Personalized nutrition powered by AI is changing the way we recommend meal plans, making them more precise, informed, and tailored to individual requirements. Mobile apps and wearable devices further facilitate individualized dietary guidance for more effective diabetes prevention and management.

Staying abreast with these breakthroughs can assist us in guiding individuals with diabetes to make well-informed choices, offering greater flexibility while helping them achieve their health goals and improving their quality of life.

2. What is the most challenging aspect of MNT in diabetes?

Ans. We all agree that MNT is a cornerstone of effective diabetes management. Having said that, there are a lot of challenges we encounter in our clinics on a day-to-day basis with respect to adherence to MNT.

a. **Behavioral change:** Persuading people to change and adopt new eating habits is not always easy. Changes suggested to their established routines are often met with resistance.

b. **Complexity:** It can be overwhelming for some individuals to comprehend portion control, carbohydrate counting, dietary modifications, and restrictions.

c. **Social and cultural influences:** Festivities, social events, family traditions, and religious customs often conflict with the recommended dietary changes.

d. **Emotional factors:** Stress and emotional eating can affect adherence.

e. **Accessibility and financial constraints:** Cost and availability of healthy eating options can impede adherence.

f. **Lack of support:** Adherence may deteriorate in the absence of adequate support from the health care team, family, and peers.

g. **Irregular follow-up:** Irregular follow-ups with the health care team to monitor progress and address challenges can hinder compliance.

3. How do you convince people to address these challenges?

Ans. With more than two decades of clinical experience as a dietitian and diabetes educator, the following strategies have helped my patients adopt healthy eating habits and improve compliance with MNT.

a. **Nutrition education:** Give concise, individualized information elucidating the benefits of MNT in improving glycemic control, quality of life, and preventing life-threatening complications. A number of counseling sessions spread over a few months will avoid overwhelming the individual with too much information in one go.

b. **Personalized nutrition:** Work closely with the patient to set realistic short-term and long-term goals. Make small, sustainable changes. Tailor meal plans, taking into account the individual's personal and cultural preferences, socioeconomic status, work routine, and lifestyle, providing flexibility and thereby improving adherence.

c. **Behavioral counseling:** Find out if the patient is willing to make suggested changes. Refer to a psychological counselor if required to understand and address emotional triggers and learn coping mechanisms and stress management techniques. Promote self-monitoring, journaling, and mindful eating.

d. **Family and peer support:** Create a supportive environment by involving family members and peers in the diabetes care plan. Ensure that the entire family eats the same meals and that the person with diabetes does not feel sidelined and deprived.

e. **Regular follow-up and monitoring:** Schedule regular follow-ups to monitor progress, address barriers and challenges, and make necessary tweaks to the meal plan.

f. **Tools and resources:** To improve adherence, provide useful resources like measuring cups and spoons, patient education books and leaflets, easy-to-make healthy recipes, information on decoding food labels, healthy grocery shopping lists, food diaries, and mobile apps.

g. **Positive reinforcement:** Do not be overly critical. Acknowledge efforts and celebrate small wins. Positive reinforcement will help improve compliance.

h. **Cost-effective, healthy food options:** Suggest budget-friendly and healthy eating-out options.

I. **Collaboration:** Collaborate and work cohesively with other members of the diabetes care team and caregivers, adopting a patient-centered approach to strengthen compliance.

By addressing obstacles and offering tailored structured programs and ongoing support, one can achieve compliance with MNT.

4. Are there any dietary trends or fads that individuals with diabetes should be cautious about?

Ans. When it comes to MNT, it is important to remember that one size does not fit all. What suits one individual can harm the other. Emerging, popular diet trends like low-carbohydrate ketogenic diets, paleo diets, vegan diets, or intermittent fasting, if desired to be followed, must be done after the consent of the treating physician. These diets must be carefully planned and executed after evaluating the pros and cons, following consultation, and under the strict supervision of a qualified dietitian to prevent hypoglycemia and nutritional deficiencies arising out of these diets. For example, a vegan diet can result in vitamin B_{12} and iodine deficiency. The ketogenic diet excludes many food groups and can result in nutritional deficiencies requiring supplementation.

The ADA and Research Society for the Study of Diabetes in India (RSSDI) clearly state that individuals on insulin, sodium-glucose cotransporter-2 (SGLT-2) inhibitors, alpha-glucosidase inhibitors, and oral hypoglycemic agents like sulphonylureas must consult their treating physician before embarking on a low-carb/ketogenic diet or intermittent fasting. The medications will need to be adjusted by the physician to avert hypoglycemia or any other side effects.

Women who are pregnant or breastfeeding, individuals who have or are at risk for disordered eating, a history of renal disease, or any other medical condition should be discouraged from following the low-carbohydrate ketogenic diet or intermittent fasting.

Also, these diets may not be sustainable in the long term; hence, it is recommended to follow a balanced diet that has no expiry date. Moderation is key!

5. Nutritional science is constantly evolving, and there is so much information available freely through all forms of media. How does one distinguish between right and wrong information?

Ans. People must be cautioned to avoid consulting Dr. Google, social media influencers, gym instructors, or self-proclaimed health experts. They must always check the qualifications of the dietitian and physician they are consulting. Having thousands of followers on social media does not mean that the person is qualified and an authority in the field.

They must not fall prey to information freely available on social media or WhatsApp forwards without authenticating the information with their treating physician and dietitian.

For authentic information on nutrition and diabetes, they can refer to websites such as www.rssdi.in and www.diabetes.org, which are scientific national and international bodies of great repute.

Busting the Myths of Insulin Therapy: A Doctor's Experience on the MyCare Patient Support Program

Dr. Kunal Kundan

MBBS, Fellowship in Diabetology, FRSPH (UK)

Janki Diabetes Care Center, Bihar

A 76-year-old man with type 2 diabetes and multiple comorbidities was managed by Dr. Kunal Kundan.

Here's what Dr. Kundan has to say:

The patient was a known case of diabetes, chronic kidney disease (CKD), anemia, and also had urinary incontinence. His blood glucose levels were fluctuating too much. He was in frail condition and could not come for a consultation, so his wife came with reports and sought my advice. I initiated him on premix insulin twice daily, along with other oral drugs and supportive medicines for his comorbidities. The patient's wife was anxious about insulin administration and was also apprehensive about the diet and lifestyle changes that he would need to make. I referred her to my MyCare Diabetes Educator (MDE), Preeti Kumari. Preeti took a detailed history of the patient and counseled the patient's wife on the dietary modifications and lifestyle changes that the patient should gradually make. She also recommended some form of physical activity like yoga. Since the wife was very nervous about starting insulin for the patient, Preeti first clarified her myths about insulin. Then, she demonstrated the right way to administer insulin and explained its storage and care. On the next visit, the patient came along with his wife and was in much better condition and was feeling energetic and positive. His glucose levels were much better controlled. His fasting sugar came down from 160 mg/dL to 100 mg/dL, and postprandial sugar reduced from 273 mg/dL to 140 mg/dL. His creatinine was stable, and I reduced his insulin dose. MDE Preeti also met and counseled him about positive lifestyle changes, dietary modifications, and the importance of regular exercise. He was happy with the consults and promised to follow up regularly.

Ms. Preeti Kumari

NDEP and T1DE Certified Diabetes Educator

Here's what MDE Preeti Kumari has to say:

Busting myths about insulin and reassuring about its safety and benefits, along with regular teleconnects to follow up, helped to gain the trust of the patient and his wife, and they began to comply to the advice. Dietary and lifestyle changes were also explained, and gradual improvement in these was also seen. I motivated the patient to continue the treatment and lifestyle advice. He felt good, and his energy improved, and he became mobile.

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*PWD: People with Diabetes

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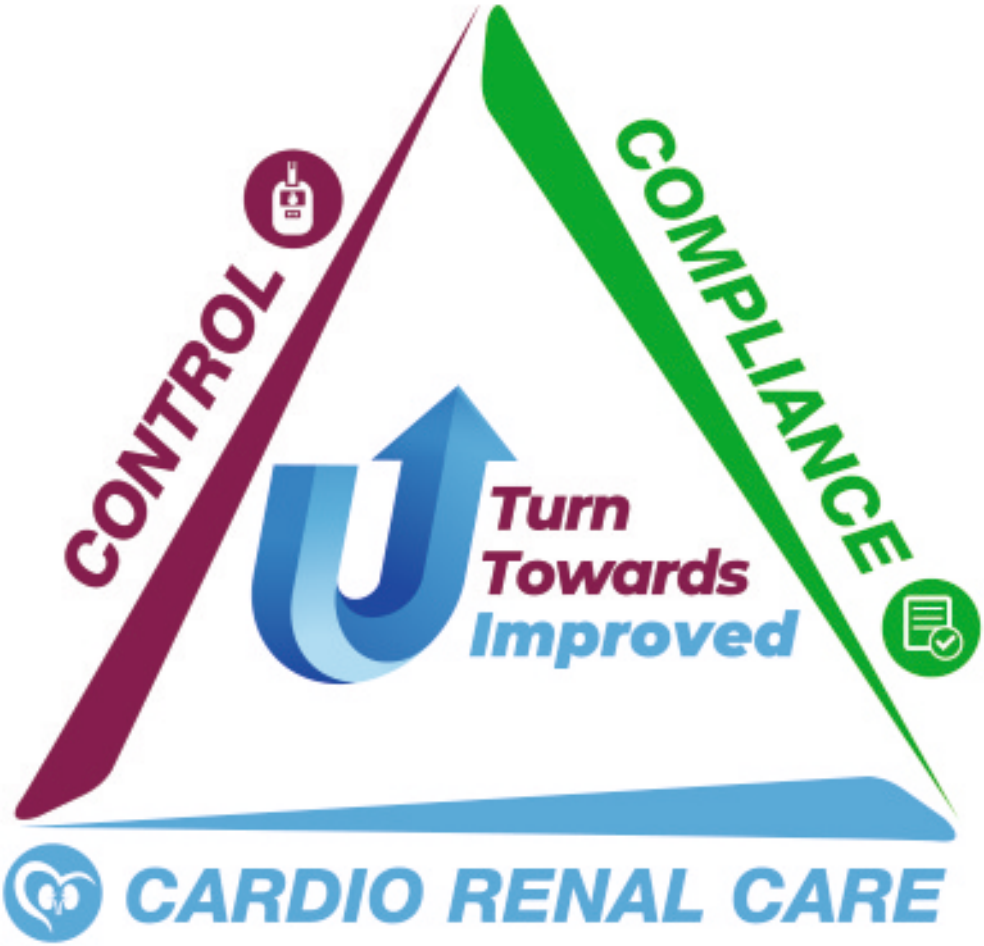

In case of any adverse events, kindly contact: pv@usv.in For the use of registered medical practitioner, hospital or laboratory

Abridged Prescribing Information

UDAPA-TRIO Forte, UDAPA-TRIO, Dapagliflozin, Sitagliptin & Metformin Hydrochloride Extended Release Tablets **Composition:** Dapagliflozin 10 mg, Sitagliptin 100 mg & Metformin Hydrochloride Extended Release 1000 mg tablets Dapagliflozin propanediol monohydrate eq. To Dapagliflozin 10 mg Sitagliptin Phosphate Monohydrate IP Eq. Sitagliptin 100 mg Metformin Hydrochloride IP (as Extended Release) 1000 mg Dapagliflozin10 mg, Sitagliptin 100 mg & Metformin Hydrochloride Extended Release 1000 mg tablets Dapagliflozin propanediol monohydrate eq. To Dapagliflozin 10 mg Sitagliptin Phosphate Monohydrate IP Eq. Sitagliptin 100 mg Metformin Hydrochloride IP (as Extended Release) 500 mg **Indication:** It is indicated as an adjunct to diet and exercise to improve Glycemic Control adults with type 2 diabetes mellitus Recommended Dosage: As directed by the physician. **Method of Administration:** Oral **Adverse Reactions:** Most common adverse reactions reported are: Dapagliflozin - Female genital mycotic infections, Nasopharyngitis, Urinary tract infections. Sitagliptin - Upper respiratory tract infection, nasopharyngitis and headache. Metformin - Diarrhea, nausea/vomiting, flatulence, asthenia, indigestion, abdominal discomfort, and headache. **Warnings and Precautions:** Dapagliflozin: Volume depletion; Ketoacidosis in patients with Diabetes Mellitus; Urosepsis and Pyelonephritis; Hypoglycemia; Genital mycotic infections Sitagliptin: **General:** Sitagliptin should not be used in patients with type 1 diabetes or for the treatment of Diabetic Ketoacidosis. Acute pancreatitis: Hypoglycemia is used in combinations when combined with other anti-hyperglycemic medicinal product; Renal impairment: Hypersensitivity reactions including anaphylaxis, angioedema, and exfoliative skin conditions - Steven johnson syndrome; Bullous pemphigoid Metformin Hydrochloride: Lactic acidosis; In case of dehydration (severe diarrhea or vomiting, fever or reduced fluid intake), metformin should be temporarily discontinued and contact with a healthcare professional is recommended. Contraindications: Hypersensitivity to the active substance of Dapagliflozin, Sitagliptin & Metformin or to any of the excipients listed. Any type of acute metabolic acidosis (such as lactic acidosis, diabetic ketoacidosis). Diabetic pre-coma; Severe renal failure (eGFR < 30ml/min); Acute conditions with the potential to alter renal function such as: Dehydration, Severe infection, Shock; Acute or chronic disease which may cause tissue hypoxia such as: Cardiac or respiratory failure. Recent myocardial infarction, Shock, Renal Impairment, Acute intoxication, Alcoholism. **Use in special population:** Pregnant women: Due to lack of human data, drugs should not be used during pregnancy. **Lactating women:** It should not be used during breastfeeding. Pediatric patients: The safety and efficacy of drugs has not yet been established. No data is available. **Geriatric Patients:** In patients >65 years, it should be used with caution as age increases. For Additional Information/full prescribing information, please write to us: USV Private Limited, Arvind Vithal Gandhi Chowk, B.S.D Marg, Govandi, Mumbai - 400088 Last updated on 02/04/2024.

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*L Ravikumar et al., Cardiol Cardiovasc Med 2023; 7: 141-144. #= no. of patients | #As per the literature search (PubMed and Google Scholar) on 21st March 2024

Reference: 1. Singh AK. et. al., Endocr Pract. 2023 Jul;29(7):509-516.

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Updated on 20th March 2024
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Low-Carb Diets: Are They Suitable for Children and Teens with Diabetes or Diabetes Risk?

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Carbohydrate restriction is increasingly popular for weight loss and glycemic control in diabetes, but evidence of its use in children and teens is limited. The American Academy of Pediatrics has issued new guidance on low-carb diets for youth with type 1 diabetes, obesity, prediabetes, and type 2 diabetes.

For type 1 diabetes

Very low-carb (<50 g/day) or ketogenic (<20 g/day) diets are not recommended, except under close medical supervision, due to risks like growth failure and nutritional deficiencies. The International Society for Pediatric and Adolescent Diabetes (ISPAD) 2022 guidelines state that strict compliance to very low-carbohydrate diets may result in ketonemia or ketosis, dyslipidemia, and disordered eating behaviors. Restricted carbohydrate diets may increase the risk of hypoglycemia or possibly impair the effect of glucagon in hypoglycemia treatment. A moderately low-carb diet (26–40% of calories from carbs) with higher protein and healthy fats may be considered if families choose it, but it requires careful monitoring.

For obesity, prediabetes, and type 2 diabetes

Reducing the intake of refined carbohydrates, sugary drinks, and ultra-processed foods is advised to improve weight, glycemia, and metabolic health. Very low-carb diets can promote short-term diabetes remission and weight loss, but long-term outcomes are unclear. Moderate carb restriction, along with healthy eating patterns like the Mediterranean diet, may be beneficial.

General considerations

Any restrictive diet poses risks like nutritional deficiencies, disordered eating, and slowed growth in youth. Eliminating sugary beverages is a good first step. Counseling families and providing support for sustainable lifestyle changes is key. Close medical follow-up using established monitoring guidelines is essential if very low-carb diets are undertaken. Increasing physical activity and improving overall diet quality are also important for diabetes prevention and management in children and adolescents.

Key points

- The American Academy of Pediatrics advises against very low-carb or ketogenic diets for children with type 1 diabetes due to potential risks.
- For those with obesity, prediabetes, or type 2 diabetes, reducing refined carbohydrates is recommended.
- Any restrictive diet poses risks, so support for sustainable lifestyle changes is crucial, along with close medical monitoring if very low-carb diets are chosen.
- Increasing physical activity and improving overall diet quality are important for diabetes prevention and management in youth.

Resources:

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Paradigm of Diabetes Management in Menopause

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Menopause marks a significant and often challenging phase in a woman's life, particularly due to the increased risk of diabetes mellitus and cardiovascular disorders. Typically occurring between the ages of 40 and 50, menopause coincides with these health conditions, creating a complex interplay between hormonal changes and metabolic health.

Impact of menopause on diabetes mellitus

The influence of menopause on diabetes management still requires further research and comprehension. Hormonal fluctuations during menopause may potentially affect the management of diabetes. While menopause is not a significant cause of diabetes, several postmenopausal changes, such as increased abdominal adiposity and hypertension, elevate the risk of developing type 2 diabetes. Abdominal obesity, in particular, amplifies insulin resistance.

Early menopause (before 45 years) and premature ovarian insufficiency (before 40 years) are linked to a heightened risk of diabetes. Conversely, diabetes may accelerate ovarian aging, thus leading to early menopause. Menopausal symptoms, such as hot flashes-induced sleep disruptions and declining estrogen levels, further complicate blood glucose management. The decrease in estrogen levels also correlates with increased insulin resistance.

During the perimenopausal period, fluctuations in hormone levels can cause erratic changes in blood glucose levels without apparent triggers. Additionally, in menopause, vaginal dryness poses a risk factor for infections, exacerbating difficulties in blood glucose control. Prompt treatment is essential in managing this complication.

Symptoms co-existing with diabetes and menopause

1. Hot flushes: Hot flushes present a particularly challenging symptom as they can be mistaken for hypoglycemic events due to similarities like sweating and palpitations. Consequently, patients may require frequent monitoring of blood glucose levels to prevent incorrect hypoglycemic treatment. Continuous glucose monitoring is often more beneficial than traditional finger prick tests in these cases.
2. Dry skin
3. Vaginal dryness
4. Blurred vision
5. Increased cardiovascular disease (CVD) risk

Management of diabetes in menopausal woman

1. There is a need for frequent checking of blood glucose and maintaining food records.
2. Due to increased insulin resistance, the dose of oral antidiabetic medication and insulin may need to be adjusted.
3. Eating healthy food and correcting vitamin D deficiency is recommended.
4. Regular exercise must be done.
5. Discuss hormone replacement therapy (HRT) as an option; HRT may not be suitable for all women regardless of whether they have diabetes or not. HRT may be beneficial for women to help relieve distressing menopausal symptoms and help with diabetes management.
6. Metformin is very helpful in the management of diabetes because it helps to decrease insulin resistance and obesity.
7. CVD risk and blood cholesterol levels must be checked often.
8. Weight management is important.
9. There should be tracking of genitourinary infection control.

Key points

- Menopause increases diabetes and cardiovascular risks due to hormonal changes.
- Hormonal fluctuations impact diabetes management, increasing insulin resistance.
- Early menopause and diabetes are linked; diabetes may accelerate ovarian aging.
- Menopausal symptoms complicate blood glucose control, requiring frequent monitoring and treatment.
- Diabetes management in menopausal women involves regular monitoring, medication adjustment, healthy lifestyle, HRT consideration, metformin use, and managing cardiovascular risk.

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Exploring the Effectiveness, Feasibility, and Long-Term Impact of Low-Carb Ketogenic Diets

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Among numerous dietary therapies,low-carbohydrate diets (50–130 g/day) and ketogenic diets (20–50 g/day) have gained interest as quick and effective weight-loss strategies. These diets, characterized by high fat, moderate protein, and low-carbohydrate intake, have also gained significant attention for their potential benefits in metabolic health. The ketogenic diet was originally introduced as a treatment for drug-resistant epilepsy in young patients, and this remains its only clinically validated application till date. Understanding the effectiveness, feasibility, and long-term impact of low-carb ketogenic diets in individuals with diabetes is important for making appropriate recommendations.

Effectiveness: Several studies highlight the effectiveness of ketogenic diets in promoting weight loss and improving metabolic health markers. A systematic review noted that individuals on a ketogenic diet experienced significant weight loss and improved glycemic control compared to those on a low-fat diet, particularly in individuals with obesity and type 2 diabetes. Another study reported that ketogenic diets led to greater reductions in body weight, waist circumference, and fasting glucose levels compared to conventional low-fat diets. These findings suggest that ketogenic diets can be an effective tool for weight management and metabolic health improvement.

Feasibility: Despite the benefits, the feasibility of adopting and maintaining a ketogenic diet poses challenges. The restrictive nature of the diet, which requires meticulous planning and adherence to low-carbohydrate intake, can be difficult for many individuals to sustain over the long term. Moreover, social and cultural factors, including the widespread consumption of high-carbohydrate foods in countries like India, can hinder adherence. It is essential for healthcare providers to offer continuous support and education to enhance the feasibility of this dietary approach.

Long-term impact: The long-term impact of ketogenic diets on health is a topic of ongoing research and debate. Some studies suggest that prolonged adherence to a ketogenic diet can lead to sustained weight loss and improvements in cardiovascular risk factors. For instance, individuals following a ketogenic diet for over a year maintained significant weight loss and improved high-density lipoprotein (HDL) cholesterol levels. However, concerns remain regarding potential negative effects, such as increased low-density lipoprotein (LDL) cholesterol levels and nutrient deficiencies due to the restrictive nature of the diet. Its efficacy in the long-term in relation to cardiovascular disease mortality is not well researched and understood. The Scientific Advisory Committee on Nutrition (SACN) reported that the long-term therapeutic benefits of low-carbohydrate diets are inconsistent and inconclusive due to a lack of comprehensive long-term data. They concluded that low-carbohydrate diets

(50–130 g per day) are neither superior nor inferior to other dietary patterns. The ketogenic diet, which provides an even lower amount of carbohydrates (20–50 g per day), has yet to be extensively reviewed and therefore, cannot currently be recommended for diabetes management. While low-carbohydrate and ketogenic diets might be beneficial for adults with type 2 diabetes, they are not appropriate for children with type 1 diabetes. The International Society for Pediatric and Adolescent Diabetes (ISPAD) guidelines suggest these diets may not be nutritionally adequate and may increase the risk of growth failure.

In conclusion, low-carb ketogenic diets have shown considerable promise in promoting weight loss and improving metabolic health, making them an effective dietary intervention for individuals with type 2 diabetes. However, the feasibility of long-term adherence to such a restrictive diet can be challenging, and the long-term health impacts require further investigation. Healthcare providers should focus on personalized dietary planning and provide evidence-based medical nutrition therapy to meet health goals and ensure long-term benefits. As research progresses, a clearer understanding of the long-term effects and practical approaches to sustaining a low-carbohydrate ketogenic diet may emerge, potentially broadening its application in clinical practice.

Key points

- Low-carb ketogenic diets are effective for weight loss and improving metabolic health markers, particularly in individuals with type 2 diabetes.
- Maintaining a ketogenic diet is challenging due to its restrictive nature and cultural dietary preferences, especially in a carb-rich country like India, necessitating continuous support and education from healthcare providers.
- The long-term therapeutic benefits are inconsistent and inconclusive with respect to nutrient deficiencies, lipid profile, and cardiovascular mortality.
- Due to limited long-term data, ketogenic diets cannot yet be recommended for diabetes management.
- Personalized dietary planning and evidence-based medical nutrition therapy are essential for achieving health goals and ensuring long-term benefits in individuals with type 2 diabetes mellitus (T2DM).

Resources:

1. Zaki HA, Iftikhar H, Bashir K, *et al.* A Comparative Study Evaluating the Effectiveness Between Ketogenic and Low-Carbohydrate Diets on Glycemic and Weight Control in Patients With Type 2 Diabetes Mellitus: A Systematic Review and Meta-Analysis. *Cureus* May 2022, 14(5): e25528. doi:10.7759/cureus.25528
2. Parry-Strong A, Wright-McNaughton M, Weatherall M, *et al.* Very low carbohydrate (ketogenic) diets in type 2 diabetes: A systematic review and meta-analysis of randomized controlled trials. *Diabetes Obes Metab.* 2022;24(12):2431-2442. doi:10.1111/dom.14837
3. Dashti HM, Mathew TC, Al-Zaid NS. Efficacy of Low-Carbohydrate Ketogenic Diet in the Treatment of Type 2 Diabetes. *Med Princ Pract.* 2021;30(3):223-235. doi:10.1159/000512142
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5. Firman CH, Mellor DD, Unwin D, Brown A. Does a Ketogenic Diet Have a Place Within Diabetes Clinical Practice? Review of Current Evidence and Controversies. *Diabetes Ther.* 2024;15(1):77-97. doi:10.1007/s13300-023-01492-4

Efficacy of Dietary Approaches to Stop Hypertension (DASH) Diet in Diabetes

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Hypertension (high blood pressure) is a common comorbidity among individuals with diabetes. It is also an important risk factor for stroke, myocardial infarction, and heart failure in individuals with diabetes. For many years, the DASH diet has been recommended as nutritional management for individuals with hypertension.

The DASH eating pattern helps in the reduction of blood pressure by encouraging the consumption of foods that are low in saturated fat, total fat, cholesterol, and sodium while emphasizing foods high in potassium, magnesium, and fiber. In terms of actual food choices, the DASH eating pattern encourages whole grains, fat-free or low-fat dairy products, fruits, vegetables, poultry, fish, and nuts. Foods that are limited include fatty meats, full-fat dairy products, tropical oils (e.g., coconut, palm, and palm kernel oils), sweets, and sugar-sweetened beverages.

There is strong evidence suggesting its beneficial role in lowering blood pressure in individuals without diabetes. The DASH diet has also shown beneficial effects on blood pressure reduction in individuals with diabetes. In addition, some studies have reported improved fasting blood glucose and HbA1c levels with the DASH diet. DASH eating pattern can provide upwards of 55% of calories from carbohydrates, which may be a high-carbohydrate intake for some people with type 2 diabetes. Thus, DASH must be advised to individuals with diabetes while considering various factors such as the level of glycemic control, current eating pattern, presence of hypertension as a comorbidity, and cultural and personal preferences.

The DASH eating pattern, while not aimed directly at weight loss, emphasizes fruits and vegetables, low-fat dairy products, and limited intake of red meat and sweets. This can be advantageous for those aiming to lose weight and subsequently result in improved glycemic control. It's crucial for individuals with diabetes to practice moderation in their consumption of fruits as part of the DASH diet to avoid fluctuations in blood glucose levels.

Resources:

1. Tseng E, Appel LJ, Yeh HC, *et al.* Effects of the Dietary Approaches to Stop Hypertension Diet and Sodium Reduction on Blood Pressure in Persons With Diabetes. *Hypertension.*2021;77(2):265-274. doi:10.1161/HYPERTENSIONAHA.120.14584
2. Campbell AP. DASH Eating Plan: An Eating Pattern for Diabetes Management. *Diabetes Spectr.* 2017;30(2):76-81. doi:10.2337/ds16-0084

Frequently Asked Questions on Nutritional Advances in Diabetes

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1. I am a 62-year-old individual with diabetes mellitus for the past 11 years. I've heard that I shouldn't eat sweet fruits such as mango, custard apple, and sapota. Is this true?

Ans. It is a common myth that people with diabetes should avoid certain fruits because they are "too sweet." While some fruits are sweet to taste, it is the total carbohydrate content that affects blood glucose levels.

When choosing fruits, consider that one serving should contain no more than 15 grams of carbohydrates (medium-sized fruit/1 cup). Additionally, the ripeness of the fruit can impact glucose levels, with semi-ripe fruits generally causing less of a spike compared to over-ripe fruits. Also, the timing of consumption influences post-meal glucose levels. Consuming fruit as a mid-meal snack or before exercise elicits a better glucose profile than when consumed with main meals. Hence, the consumption of fruit with main meals or immediately post meals, which is a common routine in most households, should be avoided.

2. My 8-year-old son was diagnosed with type 1 diabetes mellitus a few months ago. He was very fond of sweets, but post his diagnosis, we have reduced his consumption. We now make all our sweets and baked goods with either organic honey/jaggery or brown sugar instead of white sugar, as we read online that it's a much healthier substitute for white sugar. Is this true?

Ans. It's a common misconception that organic honey, jaggery, or brown sugar are healthier substitutes for white sugar, especially for individuals with diabetes. While these sweeteners may contain trace amounts of vitamins and minerals, their primary components are still sugars that have similar effects on blood glucose levels.

Honey, jaggery, and brown sugar all have high glycemic indices, meaning they can cause rapid spikes in blood glucose levels, just like white sugar. For effective diabetes management, it's crucial to monitor and limit the intake of all forms of sugar, regardless of their source. Always consult with a healthcare professional or a dietician to develop a dietary plan that is safe and appropriate for your son's condition.

3. I am a 34-year-old individual diagnosed with diabetes mellitus. Post my diagnosis, I was told to cut out rice completely from my diet. I am trying to follow the same, but some days, I really crave for rice. Is there anything I can do to allow me to eat rice occasionally?

Ans. It's understandable to crave rice, especially if it has been a staple in your diet. While it's important to manage your carbohydrate intake to maintain stable blood glucose levels, there are ways to occasionally include rice in your diet with careful planning. One effective method is the cooked and cooled technique. When rice is cooked and then cooled, it forms resistant starch. This process can lower the glycemic index of the rice, preventing a spike in blood glucose levels. Here is how you do it .

Prepare the rice as you normally would. Allow the cooked rice to cool completely in the refrigerator for several hours (>12–18 hrs) or overnight. Pour hot gravy on the cooled rice. Avoid reheating the rice as it breaks the resistant starch formed.

In addition to using the cooked and cooled method, manage your rice intake by limiting portion size and pairing rice with high-fiber vegetables, lean proteins, and healthy fats to prevent blood glucose spikes. Choose brown rice or other whole-grain options for more fiber and nutrients.

Using these strategies, you can occasionally enjoy rice while effectively managing your diabetes, but always consult your healthcare provider for personalized advice.

Recipe: Low-Carb Hara Bhara Kebabs

Makes: 7 no.

Ingredients	Amount
Paneer (grated)	1 cup (80 g)
Gram flour (besan)	2 tbsp.
Spinach (chopped)	2 cups
Onion (chopped)	¼ cup
Capsicum (chopped)	¼ cup
Green peas	¼ cup
Mint leaves (chopped)	Handful
Coriander (chopped)	½ cup
Ginger garlic paste	2 tsp.
Green chilli (finely chopped)	3 no.
Coriander powder	1½ tsp.
Amchur powder	1 tsp.
Garam masala	1 tsp.
Chaat masala	1 tsp.
Jeera powder	1 tsp.
Salt	As per taste
Oil	2 tsp.

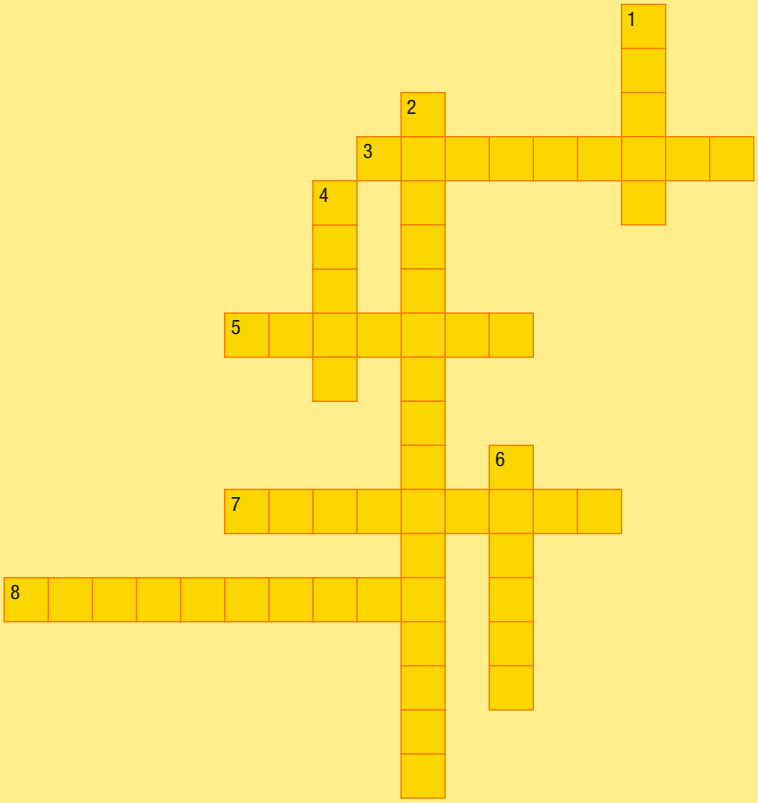
*1 cup: 200 mL; 1 tablespoon: 15 mL; 1 teaspoon: 5 mL

Method

- Heat oil in a pan; add ginger garlic paste and green chillies. Sauté for a minute.
- Add all the veggies. Cook on high flame for 3–4 mins.
- Once done, cool it down and grind into a coarse mixture with the coriander and mint leaves.
- Transfer the mixture to a big bowl, add the paneer and besan to it, followed by all the powdered spices and salt. Mix well.
- Divide the mixture equally into 7 balls. Shape into round kebabs and flatten them. Keep aside.
- Grease a non-stick pan with oil lightly and fry the kebabs until golden brown on both sides.
- Serve hot with mint coriander chutney.

Crossword

Complete the crossword puzzle below



Across

3. These seeds are rich in soluble fiber and help to reduce blood sugar levels
5. _____ of the plate should have complex carbohydrate
7. Diet which is very low on carbohydrate
8. Fruit juices should be replaced with _____

Down

1. Vegetables and fruits are a good source of
2. Cooking and cooling rice helps in formation of _____
4. Sucrose in the ingredient list means the product contains _____
6. This spice tastes great in tea and helps to improve immunity

Answers

Across: 3. Fenugreek, 5. Quarter, 7. Keto diet, 8. Wholefruit

Down: 1. Fiber, 2. Resistant starch, 4. Sugar, 6. Ginger

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Glycomet®-GP 2
Metformin Hydrochloride 500 mg SR + Glimepiride 2 mg

Glycomet®-GP 2/850
Metformin Hydrochloride 850 mg SR + Glimepiride 2 mg

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Metformin Hydrochloride 1000 mg SR + Glimepiride 0.5 mg

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Glycomet®-GP1 FORTE
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Glycomet®-GP3 FORTE
Metformin Hydrochloride 1000 mg SR + Glimepiride 3 mg

Glycomet®-GP2 FORTE
Metformin Hydrochloride 1000 mg SR + Glimepiride 2 mg

Abridged Prescribing Information

Active Ingredients: Metformin hydrochloride (as sustained release) and glimepiride tablets **Indication:** For the management of patients with type 2 diabetes mellitus when diet, exercise and single agent (glimepiride or metformin alone) do not result in adequate glycaemic control. **Dosage and Administration:** The recommended dose is one tablet daily during breakfast or the first main meal. Each tablet contains a fixed dose of glimepiride and Metformin Hydrochloride. The highest recommended dose per day should be 8 mg of glimepiride and 2000mg of metformin. Due to prolonged release formulation, the tablet must be swallowed whole and not crushed or chewed. **Adverse Reactions:** For Glimepiride: hypoglycaemia may occur, which may sometimes be prolonged. Occasionally, gastrointestinal (GI) symptoms such as nausea, vomiting, sensations of pressure or fullness in the epigastrium, abdominal pain and diarrhea may occur. Hepatitis, elevation of liver enzymes, cholestasis and jaundice may occur; allergic reactions or pseudo allergic reactions may occur occasionally. For Metformin: GI symptoms such as nausea, vomiting, diarrhea, abdominal pain, and loss of appetite are common during initiation of therapy and may resolve spontaneously in most cases. Metallic taste, mild erythema, decrease in Vit B12 absorption, very rarely lactic acidosis, Hemolytic anemia, Reduction of thyrotropin level in patients with hypothyroidism, Hypomagnesemia in the context of diarrhea, Encephalopathy, Photosensitivity, hepatobiliary disorders. **Warnings and Precautions:** For Glimepiride: Patient should be advised to report promptly exceptional stress situations (e.g., trauma, surgery, febrile infections), blood glucose regulation may deteriorate, and a temporary change to insulin may be necessary to maintain good metabolic control. Metformin Hydrochloride may lead to Lactic acidosis; in such cases metformin should be temporarily discontinued and contact with a healthcare professional is recommended. Sulfonylureas have an increased risk of hypoglycaemia. Long-term treatment with metformin may lead to peripheral neuropathy because of decrease in vitamin B12 serum levels. Monitoring of the vitamin B12 level is recommended. Overweight patients should continue their energy-restricted diet, usual laboratory tests for diabetes monitoring should be performed regularly. **Contraindications:** Hypersensitivity to the active substance of glimepiride & Metformin or to any of the excipients listed. Any type of acute metabolic acidosis (such as lactic acidosis, diabetic ketoacidosis, diabetic pre-coma). Severe renal failure (GFR<30ml/min). In pregnant women. In lactating women.Acute conditions with the potential to alter renal function (dehydration, severe infection, shock, intravascular administration of iodinated contrast agents); acute or chronic disease which may cause tissue hypoxia (cardiac or respiratory failure, recent myocardial infarction, shock); hepatic insufficiency; acute alcohol intoxication; alcoholism. **Use in a special population:** Pregnant Women: Due to a lack of human data, drugs should not be used during pregnancy. Lactating Women: It should not be used during breastfeeding. Pediatric Patients: The safety and efficacy of drugs has not yet been established. Renal impairment: A GFR should be assessed before initiation of treatment with metformin containing products and at least annually thereafter. In patients at increased risk of further progression of renal impairment and in the elderly, renal function should be assessed more frequently, e.g. every 3-6 months.

Additional information is available on request.

Last updated: March 13, 2023

In case of any adverse events, kindly contact: pv@usv.in For the use of registered medical practitioner, hospital or laboratory.

USV Private Limited Corvette Team

Arvind Vithal Gandhi Chowk, B. S. D. Marg, Govandi, Mumbai - 400 088. | Tel.: 91-22-2556 4048 | Fax 91-22-2558 4025 | www.usvindia.com

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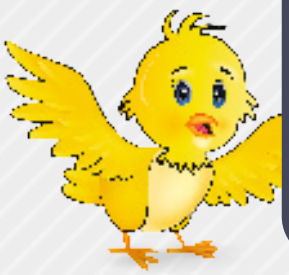

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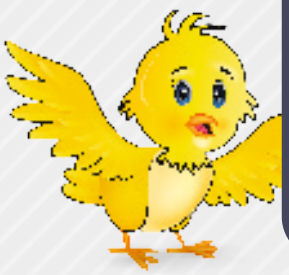

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