RSSDI Indian Diabetes

EDUCATOR JOURNAL

Theme of the Month

Diabetes and Lifestyle

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 & 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.

Lifestyle modification is a key pillar in the prevention and management of diabetes. Lifestyle medicine is a part of the clinical guidelines to achieve glycemic control. This month's IDEJ aims to focus on the importance of the components of lifestyle medicine, like healthy eating, exercise, sleep, and stress management. We hope this issue will help diabetes educators to support their patients with diabetes in undertaking lifestyle changes to improve self-management and treatment compliance.

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

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Article: Embracing Lifestyle Medicine as a Modality for Diabetes Care

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Article: Staying Hydrated with Diabetes

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Article: Role of Exercise in Type 2 Diabetes (T2DM)

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Article: Frequently Asked Questions

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Embracing Lifestyle Medicine as a Modality for Diabetes Care

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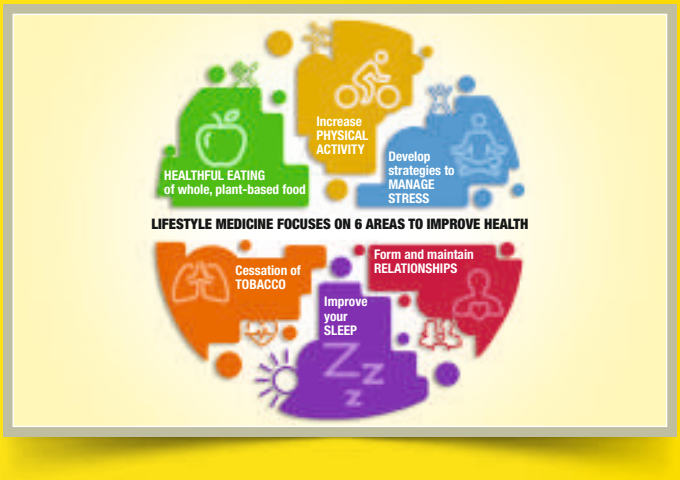
Lifestyle medicine (LM) is a novel branch in the clinical practice of medicine and is gaining grounds due to its benefits. LM is a preventive healthcare approach. It involves the use of lifestyle in the prevention and management of health conditions, such as non-communicable diseases (diabetes and cardiovascular disease). It emphasizes education and motivation to improve quality of life by means of healthier habits and behaviors, including a well-balanced nutritious diet, regular physical activity, adequate sleep, stress management, avoidance of risky substances, and positive social relations. It also focuses on addressing the root causes of many chronic conditions such as diabetes, and thus, has the potential to significantly decrease morbidity and mortality rates, as well as the financial burden associated with its management. The pillars of LM are shown in the figure below.



1. Increased physical activity and exercise
2. Stress management
3. Healthy eating
4. Adequate sleep and good sleep hygiene
5. Avoid consumption of tobacco and alcohol
6. Increased mental and emotional well-being by having good social connections

All the components of LM play essential roles in the prevention of type 2 diabetes mellitus, and the management of type 1, type 2, and gestational diabetes mellitus.

Lifestyle modification is the first line of treatment in type 2 diabetes mellitus management. This is because obesity/adiposity is the main risk factor for the development of type 2 diabetes mellitus, and it is associated with cardiovascular diseases. Lifestyle modifications help manage obesity, improve blood glucose levels, and reduce or delay the progression from pre-diabetes to type 2 diabetes. The focus of LM programs in diabetes management is to improve eating habits and physical activity behavior, especially in obese individuals with type 2 diabetes mellitus, which in turn improves glycemic control symptoms, reducing the risk of complications and mortality.

Other pillars of LM, such as stress management, good mental and emotional well-being, and adequate sleep also contribute positively to diabetes management. Emotional problems like depression, anxiety, and diabetes-specific distress are observed to be common in individuals with diabetes, which negatively impacts glucose levels. Thus, it is important to ensure good mental well-being as part of the treatment plan. Sleep is essential for rejuvenating the body and inadequate sleep will affect all body processes, including glucose metabolism. Sleep apnea is also prevalent in type 2 diabetes secondary to obesity, impacting sleep quality. Poor sleep may lead to impaired decision-making and loss of concentration, affecting healthy food choices and, as a result deteriorating glycemic control. Sleep disturbance is often an unrecognized health issue in individuals with type 2 diabetes. Hence, healthcare professionals and diabetes educators must pay attention to this arm of treatment.

Evidence also suggests remission of type 2 diabetes mellitus is possible without pharmacotherapy, which includes lifestyle modifications which translates to the practice of LM. Increasing physical activity in the form of exercise, engaging in healthy dietary eating habits, and reducing weight are the principal goals that help achieve remission.

LM does not advise individuals to abandon or stop medications. Regular monitoring and follow-up with healthcare professionals for due course of action is important and later, maintenance of achieved health goals is important.

LM, when applied in the management and prevention of diabetes mellitus, offers a cost-effective approach. It necessitates no specialized equipment but relies on personal discipline, a quality individuals must self-enforce.

Resources:

1. Sadiq IZ. Lifestyle medicine as a modality for prevention and management of chronic diseases. *J Taibah Univ Med Sci.* 2023;18(5):1115-1117. Published 2023 Apr 15. doi:10.1016/j.jtumed.2023.04.001
2. Yvonne Buowari, D. The role of lifestyle medicine in the management of diabetes mellitus. *IntechOpen* 2021. doi:10.5772/intechopen.99555
3. Galariz KI, Narayan V, Lobelo F, Weber WB. Lifestyle and the prevention of type 2 diabetes: A static report. *American Journal of Lifestyle Medicine.* 2018;12(1):4-20.
4. Kelly J, Karlson M, Steinke G. Type 2 diabetes remission and lifestyle medicine: A position statement from the American College of Lifestyle Medicine. *American Journal of Lifestyle Medicine.* 2020. doi:10.10.1177/1559827620930962.

Diet in Diabetes Simplified

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Nutrition is the cornerstone of diabetes management as what, when, and how much one eats has a major impact on blood glucose levels, weight, and other blood variables. There is no "diabetic diet". Thus, the entire family is encouraged to follow a healthy meal plan. There is no "one-size-fits-all" diet plan but a flexible meal plan customized to address individual nutrition needs based on medical, socio-cultural, lifestyle, and regional preferences. This ensures better compliance and sustainability in individuals with diabetes which otherwise is often a challenge.

The goals of medical nutrition therapy (MNT) in type 2 diabetes are to

- Attain individualized glycemic, blood pressure, and lipid goals
- Delay or prevent complications
- Achieve and maintain body weight goals
- Maintain the pleasure of eating

For all overweight or obese individuals with diabetes or pre-diabetes, lifestyle modification is recommended to achieve and maintain a minimum weight loss of 5-7%. This includes MNT and moderate-intensity physical activity, such as brisk walking for at least 150 minutes per week, after obtaining fitness consent from the treating healthcare professional. Weight loss can be accomplished with lifestyle modification programs aiming to achieve a 500-750 kcal/day energy deficit or provide 1,200-1,500 kcal/day for women and 1,500-1,800 kcal/ day for men, adjusted for the individual's baseline body weight. For individuals with diabetes, the American Diabetes Association does not recommend a single ideal dietary distribution of calories among carbohydrates, fats, and proteins. However, it emphasizes personalized recommendations keeping individual goals in mind.

The Starch study has shown that Indian diets typically contain a high percentage of calories from carbohydrates (65-70%) and are mostly from refined sources, such as polished white rice or refined wheat and its products. Reducing overall carbohydrate intake has demonstrated the most evidence for improving glycemic control in individuals with diabetes.

Based on Indian dietary patterns, a reduced-calorie, moderate-carbohydrate (~50%), and moderate-fat (~30%) diet with healthy monounsaturated fats and an adequate amount of proteins (~20%) along with plenty of green leafy vegetables is the best alternative to ensure long-term sustenance and compliance.

Nutrient-dense carbohydrate sources that are high in fiber (20 g/1000 kcal) and minimally processed must be advised to individuals with diabetes. They are also advised to choose low glycemic index (GI) and low glycemic load (GL) foods for better post-prandial glucose control. The meal plan must include non-starchy vegetables, minimal added sugars, fruits, whole grains, and dairy products. Wholegrain food sources, such as whole wheat, unpolished rice, and millets like Jowar, Bajra, Foxtail millet, and Barnyard millet are better choices over refined flour and its products. Among fruits, seasonal fruits that are ripe but not over-ripe are suggested, as the former comparatively has a low GI. Individuals with diabetes are advised to space out fruits as mid-meal snacks and not to have them with meals or immediately post-meal.

Protein intake should be maintained at least 15% of the total calorie intake. The Indian Market Research Bureau (IMRB) 2017 survey shows that 73% of Indians are protein deficient, while >90% are unaware of their daily protein requirements. Uncontrolled glucose levels when coupled with a low protein diet may lead to sarcopenia and a weakened immune system. Hence, efforts to ensure the consumption of good quality protein in adequate amounts must be made. Protein intake can be increased by incorporating protein-rich sources like eggs, curd, buttermilk, paneer, sprouts, dal, soybean, soy chunks, soy granules, lean meat, fish, etc in the meals. The quantity of protein intake will depend on age, activity, sarcopenia, and kidney function.

Fat intake must be maintained at about less than 30% of the total calorie intake. Most of the fat intake must be advised from monounsaturated fatty acid (MUFA) and polyunsaturated fatty acid (PUFA) with saturated fatty acid (SFA) intake being less than 10% of the total calories per day.

Focusing on both the quality and quantity of oil is recommended. It is important to note that, all oils including olive oil, rice bran oil, sunflower oil, or any other oil have similar calories and should be used judiciously. On average, an individual is recommended three teaspoons per day or one tablespoon per day of cooking oil. Rotating oils or using commercially available blended oils to acquire a balance of fatty acids is advised to enjoy maximum health benefits. Foods rich in long-chain omega-3 fatty acids, such as fatty fish (100-200 g/week), nuts, and seeds like walnuts and flaxseeds are also advised.

Individuals with diabetes are recommended to avoid the consumption of foods high in saturated fat like butter, margarine, red meat, etc. The trans-fat consumption must be as close to nil. It is advised to avoid refrying and reheating cooking oils. Consumption of foods, such as fried snacks, bread, biscuits, papads, pickles, ketchup, sugar, jaggery, honey, fruit juices, aerated drinks, etc., is restricted. Individuals with diabetes are advised to refrain from regular consumption of alcohol, to stop smoking, and to avoid chewing tobacco.

Portion control is the key and the American Diabetes Association recommends choosing a 9” plate instead of a 12” plate. The recommended healthy plate should be half filled with salad and non-starchy vegetables, 1/4th of the plate should be filled with unpolished cereals, millets, and starchy vegetables, while the remaining 1/4th plate with protein-rich food sources. Healthier, protein-rich snacks for munching, such as roasted chana with unsalted peanuts, boiled chana, or sprouts chaat with veggies and unsalted nuts are advised. Adequate hydration should also be emphasized unless advised against it. In addition, maintaining meal and medication timings regularly and frequent monitoring of blood glucose levels is important to ensure they are in the normal range.

To conclude, following a meal plan for diabetes does not mean avoiding favorite foods and special family meals. Eating to manage diabetes is about making smart choices while focusing and bringing back the joy of eating and living with diabetes. The advised meal plan should be simple, sustainable, and economical to follow in the long run. Individuals with diabetes should not fall prey to information coming from social media influencers or self-proclaimed health experts without authenticating the same with the treating physician and dietitian.

Resource:

- Sheryl Salis. Diet in diabetes simplified, 2nd edition. Mumbai: Notion Press; 2020.

Glucose Monitoring in Diabetes: How Much is Enough?

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In diabetes, glucose has to travel over a thrilling roller-coaster, only that the route is never predictable to either the healthcare physician (HCP) or the person living with diabetes. This poses a problem day in and day out for obtaining good glycemic control, thereby setting precedence for sooner development of complications.

With newer advances in available drugs and technologies for diabetes, one can lead a good quality of life, despite being diagnosed with this lifestyle disorder.

However in India, the main hurdles to diabetes management are factors such as a lack of awareness about having diabetes, and once known, ignorance about taking apt steps for treatment. Evidence shows structured monitoring like the self-monitoring of blood glucose (SMBG), can help improve diabetes control and delay complications. The majority of people living with diabetes do not monitor their glucose levels at home. Statistics show India as the country with the least usage of SMBG, barely 11%. While there is incremental improvement in glucose monitoring practices in the country, there is still a long way to go ahead.

Besides SMBG, there is now available a user-friendly wearable sensor that provides continuous glucose monitoring, 24x7 for up to 14 days by measuring glucose within the interstitial fluid. This provides way more information than both SMBG and HbA1c (glycated hemoglobin) combined together. The technology aids in uncovering the hidden hypoglycemia, the unknown peaks, and depicts the extent of glycemic variability too. It actually tells us about how much time one spends within the target range. These metrics which are known as the 'time in range' (TIR) metrics are now gaining popularity within the space of diabetes management in lieu of their direct link with complications. Lower TIR escalates the risk of complications and similarly increase in the TIR can reduce the risk of complications. There are professional and personal versions within these continuous glucose monitoring (CGM) systems that can help both the HCP as well as the person living with diabetes to make informed decisions about diet and their lifestyle, thus targeting better glucose control.

The question is what to choose for monitoring and how much to monitor

When it comes to choosing a device, SMBG via glucometer happens to be the longer-available, easier option. Whereas, CGM tends to be the more informative but sometimes an overwhelming option. The frequency of monitoring shall be decided on the basis of critical criteria; most importantly, the existing glycemic control of the patient which is either depicted by the HbA1c or the symptoms/presenting complaints. Successful usage of monitoring also depends on user parameters, such as knowledge and understanding of the devices in discussion.

SMBG

While guidelines recommend a seven-step structured SMBG, it may not be feasible for all people with diabetes and needs to be individualized. Research Society for the Study of Diabetes in India (RSSDI) has come up with a consensus on SMBG usage on two lines: What is 'recommended' care and what is minimally required 'limited' care. This puts down clear guidance on SMBG usage based on type of diabetes, age, and special situations like pregnancy, as well as end-stage renal disease (ESRD).

Given practical challenges observed in the form of resistance from the patients, SMBG at least twice a day must be mandated for all types of diabetes. This should be in fact done in pairs to know pre-meal and post-meal changes in glucose levels.

SMBG timings should also be chosen as per the lifestyle of the person with diabetes to ensure covering up most estimated highs and lows. People who do not have a glucometer at home should be motivated to buy and carry these devices with them at all times.

CGM

Talking about CGM, it is a more informative tool and it could be used as a diagnostic, as well as a therapeutic guide. One of the personal CGM devices also turns into a glucometer when required. People living with diabetes must thereby be educated about keeping this device ready with them for better diabetes management.

Regarding CGM usage frequency, there are guidelines released where, one CGM a year should be done for all patients and for uncontrolled ones, once every 6 months. In special conditions, where glucose control is a problem, one may choose to use one sensor every 3 months as well. For patients who are tech-savvy and like to take diabetes management to the next level, CGM can be applied more frequently as per choice as well.

To summarize, the key to reaching desired targets in diabetes is effective glucose monitoring using any method. Monitoring allows us to know how glucose behaves upon different food consumption, helping us choose suitable food options, as well as portions. Exercise intensity also can impact glucose, and without monitoring one cannot know of it leading to disastrous consequences. Hence, overall, one must leverage available tools and monitor their glucose levels as much as possible to move faster towards a better glucose profile.

Smoke-Free Living: A Diabetes-Friendly Lifestyle Choice

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Smoke from cigarettes is linked to several health problems, including endothelial dysfunction, oxidative stress, inflammation, and coagulation. Smoking is a leading cause of lung cancer, chronic obstructive pulmonary disease, and cardiovascular diseases. Over 7 million people die each year from smoking-related illnesses.

People with diabetes are said to have an endothelial dysfunction mechanism comparable to what smoking causes. Therefore, it is not unexpected that smoking accelerates vascular damage in individuals with diabetes by amplifying the negative consequences of hyperglycemia. The co-existence of smoking and diabetes forms a perilous combination with potentially life-threatening consequences. The one lifestyle change that can really add valuable years to life for a person with diabetes is to quit smoking. The following are some of the main advantages of smoking cessation for people with diabetes.

- **Insulin resistance and insulin secretion**

  It has been observed that nicotine in cigarette smoke exacerbates insulin resistance and affects insulin secretion as well, making it more difficult for people with diabetes to control their blood glucose levels. Giving up on smoking can help to improve insulin sensitivity.

- **Cardiovascular complications**

  Smoking cessation can reduce the risk of heart disease, stroke, and other cardiovascular complications, which are a major concern for people with diabetes. It has been demonstrated that cigarette smoke increases the lipid profile's atherogenic nature. Smoking is linked to lower levels of cardioprotective high-density lipoprotein (HDL) and higher levels of low-density lipoprotein (LDL), total cholesterol, and triglycerides (TG).

- **Wound healing**

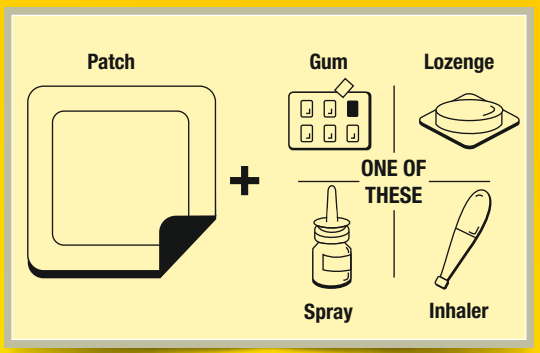
  Smoking impairs the body's ability to heal wounds, which can be a significant concern for individuals with diabetes who are prone to slow healing of wounds. Quitting smoking can improve wound healing and reduce the risk of infections and complications.

- **Renal complications**

  Smoking is considered as a risk factor for diabetic kidney disease. Smoking may contribute to the development and progression of kidney disease, by means of a mechanism that involves increasing intraglomerular capillary pressure, renovascular resistance, and progressive arteriolar deterioration. Quitting smoking can help lower the risk of these complications.

Pharmacotherapy use for smoking cessation

There are numerous pharmacotherapies available for those trying to quit smoking, including inhalers, gum, patches, lozenges, and nasal sprays that replace nicotine. Additionally, bupropion, an antidepressant, is a decent substitute for nicotine and shows promise in the treatment of diabetes.



Role of healthcare providers

In addition to smoking cessation medications, specific follow-up care or a referral to a cessation clinic should be given to individuals who are ready to stop smoking. Behavioral and cognitive strategies could be the subject of practical counseling during the follow-up care. The likelihood of smoking cessation is highest among patients who visit cessation clinics and receive medicines to help them quit. While there isn't a single drug that is better than another for people with diabetes, combination therapy should be taken into consideration, particularly for individuals who smoke heavily and have a history of failed attempts to quit.

A smoke-free lifestyle is a wise choice for people with diabetes, as it aligns with their health and well-being goals, and it can significantly reduce the risk of complications associated with both smoking and diabetes.

Resources:

1. Walicka M, Russo C, Baxter M, John I, Caci G, Polosa R. Impact of stopping smoking on metabolic parameters in diabetes mellitus: A scoping review. *World J Diabetes.* 2022;13(6):422-433. doi:10.4239/wjd.v13.i6.422
2. McDaniel JC, Browning KK. Smoking, chronic wound healing, and implications for evidence-based practice. *J Wound Ostomy Continence Nurs.* 2014;41(5):415-E2. doi:10.1097/WON.0000000000000057
3. Campagna D, Alamo A, Di Pino A, *et al.* Smoking and diabetes: dangerous liaisons and confusing relationships [published correction appears in Diabetol Metab Syndr. 2023 Jun 2;15(1):117]. *Diabetol Metab Syndr.* 2019;11:85. Published 2019 Oct 24. doi:10.1186/s13098-019-0482-2
4. Justin J. Sherman; The impact of smoking and quitting smoking on patients with diabetes. *Diabetes Spectr.* 1 October 2005;18(4):202–208. Available at: https://doi.org/10.2337/diaspect.18.4.202

Working Against the Clock: Shift Work and its Impact on Diabetes

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In today's modern workforce, the traditional 9 to 5 routine has evolved into round-the-clock operations, with flexible hours, night shifts, weekend work, and irregular schedules. However, this shift can have significant implications for individuals living with diabetes. Effective diabetes management relies on a consistent regimen of medications, dietary choices, exercise, and sleep. The demands of shift work disrupts this routine, making it challenging to maintain stable blood glucose levels. Here are a few ways how shift work impacts individuals managing diabetes.

1. **Irregular meal patterns:** Shift workers often have irregular meal times due to their changing work hours. This can make it difficult to maintain a consistent eating schedule, which is crucial for managing blood glucose levels. Inconsistent meal patterns can lead to blood glucose spikes or lows.
2. **Disrupted sleep patterns:** Shift work often involves rotating shifts or overnight shifts, which can lead to irregular sleep patterns. These disruptions to the circadian rhythm can result in poor sleep quality and inadequate sleep duration. The circadian rhythm influences the release of hormones that govern insulin sensitivity and glucose metabolism. Disrupted sleep can impair these processes, making blood glucose control more complex.

3. **Stress:** Shift work can be inherently stressful due to irregular hours and high-pressure situations. Stress can elevate blood glucose levels, making it harder to manage diabetes effectively.
4. **Lack of physical activity:** Irregular work hours can make it difficult for shift workers to engage in regular physical activity, which is essential for managing diabetes. Lack of exercise can lead to weight gain and reduced insulin sensitivity.
5. **Diet challenges:** Access to healthy food options may be limited during late-night shifts, leading to poor dietary choices. Unhealthy eating habits can affect blood glucose control.

Working against the clock disrupts the circadian rhythm which influences many aspects of diabetes management. It is essential for people with diabetes who work in shifts, to work closely with their healthcare providers to develop personalized treatment plans that consider their work schedules and lifestyle, helping them adapt to the challenges that shift work presents.

Resources:

1. Navarro DJ, Alpert PT, Cross C. The impact of shift work on diabetes self-management activities. *J Dr Nurs Pract.* 2019;12(1):66-72. doi:10.1891/2380-9418.12.1.66
2. Shift work and diabetes – night shifts. Available at: https://www.diabetes.co.uk/shift-work.html
3. Diabetes control is more difficult for night shift workers. Available at: https://www.endocrine.org/news-and-advocacy/news-room/2017/diabetes-control-is-more-difficult-for-night-shift-workers

Stress Reduction: A Key Component of Diabetes Management

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Diabetes is a growing public health concern globally in the 21st century, particularly type 2 diabetes (T2DM), which makes up 90% of all diabetes cases. This significant increase in diabetes requires self-management behaviors, especially in areas where access to healthcare is inadequate. One such aspect of behavior modification is stress management, which is vital for good glycemic control.

Stress is an inevitable part of modern life, but for those with diabetes, it can have profound and detrimental effects on their overall well-being. Stress triggers the release of stress hormones like cortisol, which can cause blood sugar levels to rise by promoting glucose production and reducing insulin's effectiveness, contributing to instability in glycemic control for individuals with diabetes. Studies have shown that stressful life experiences can reduce the effectiveness of diabetes management and therapy. Consequently, adaptive coping techniques are crucial for those who have diabetes. Stress management behavior is a skill that helps an individual to effectively deal with the duties and challenges of life. Knowing how to calm the mind and body in anxious situations can contribute to a sense of security. Here are a few tips and tricks to ease out stress.

1. **Look after oneself:** Almost everyone experiences occasional tension or frustration. Dealing with diabetes might exacerbate these emotions, leaving behind feelings of overburden. Thus, it is even more important to be kind and look after oneself in times of stress. However, this might not always be easy if one is extra busy at work or looking after family. Finding the right balance between taking care of oneself and burdening oneself with expectations of perfection is crucial. Having stressful, depressive, or low feelings for more than a week or two may signal needing help from someone to cope with diabetes. Thus, talking to someone in such situations is advisable.

2. **Talk to someone (a health professional or someone with diabetes):** Discussing what's causing stress can be helpful. It may help to change the perspective or simply help in relieving and getting it off one's chest. One should consider talking to the doctor, nurse, diabetes educator, psychologist, or a social worker about their feelings. They can help to give solutions to their problems with diabetes and may also suggest speaking with other healthcare providers if required.

   Talking to other individuals with diabetes can also help understand some of the things one is going through. Know about their diabetes management strategies and what works best for them. This can aid in making one feel less lonely and stressed. One can also inquire with medical professionals about local or online support groups for people with diabetes.

3. **Talking to loved ones and allowing them to assist in managing diabetes:** In some cases, talking with family, friends, or close ones, sharing problems and simply expressing feelings, while dealing with diabetes may help manage the condition well. On the contrary, sometimes talking to people around might add to stress. One should ask for assistance when needed. Family and friends can support in a variety of ways. They can assist in meal preparation, blood sugar monitoring, joining in physical

activity, and medication reminders. They can also find out more about diabetes and accompany the individual to the doctor's appointments. Asking loved ones for their support can ease out stress of dealing with diabetes.

4. **Take action; one step at a time:** Choosing something one can get done now and taking action before a big to-do list gets extensive can help in easing out the diabetes stress. For example, getting up from the desk and taking a short stroll around the block or setting up twice weekly 30-minute exercise intervals on the calendar. Starting with these little, healthy changes to one's daily routine might make one feel more in control. Getting enough sleep, building exercise, rest, and relaxation routines, and meditation time within the routine also can be helpful for some people to cope better with stress.

5. **Taking some "me time":** Spending some time each day doing something one truly enjoys, whether it's talking on the phone with a friend, having fun with kids or grandchildren, or working on a creative project or hobby can be a good way to get involved in activities that help in stress management.

Stress management and emotional support are associated with better diabetes self-care and enhancing the quality of life. For optimum physical and emotional well-being, it is crucial to collaborate closely with healthcare providers, adhere to individualized treatment regimens, and prioritize self-care.

Resources:

1. Eshete A, Mohammed S, Deresse T, Kifleyohans T, Assefa Y. Association of stress management behavior and diabetic self-care practice among diabetes type II patients in North Shoa Zone: A cross-sectional study. *BMC Health Serv Res.* 2023;23(1):767. Published 2023 Jul 19. doi:10.1186/s12913-023-09752-6 Available at: https://bmchealthservres.biomedcentral.com/articles/10.1186/s12913-023-09752-6
2. Pradeepa R, Mohan V. Epidemiology of type 2 diabetes in India. *Indian J Ophthalmol.* 2021;69(11):2932-2938. doi:10.4103/ijo.IJO_1627_21
3. 10 Tips for coping with diabetes distress. *Centers for Disease Control and Prevention.* Updated March 31, 2022. Accessed October 21, 2023. Available at: https://www.cdc.gov/diabetes/managing/diabetes-distress/ten-tips-coping-diabetes-distress.html
4. Ease diabetes stress. *American Diabetes Association.* Accessed October 18, 2023. Available at: https://diabetes.org/health-wellness/mental-health/ease-diabetes-care-stress
5. Stress and diabetes. *Diabetes UK.* Accessed October 25, 2023. Available at: https://www.diabetes.org.uk/guide-to-diabetes/emotions/stress

Personalized Counseling for Pregnant Woman with Gestational Diabetes Mellitus (GDM): A Doctor's Experience on the MyCare Patient Support Program

Dr. Sandeep Mondal

MBBS, MD (General Medicine)

Consultant Physician and Diabetologist,
Diabetes and Neurology Clinic, Kolkata

A pregnant lady diagnosed with GDM was managed by Dr. Sandeep Mondal.

Here's what Dr. Sandeep Mondal has to say:

I was referred a case of GDM. The lady was in her second trimester of pregnancy when she was diagnosed with GDM. Her fasting glucose (FBS) was 147 mg/dL and post-prandial (PP) was 200 mg/dL. She was very confused and had a lot of questions as to why she developed diabetes, as she had no family history of the same. She was very disturbed with this diagnosis and I felt that the MyCare program would benefit her greatly.

I advised her to be a part of the program, and here is where she was introduced to her MyCare diabetes educator (MDE) Ms. Papia Ghosh. During the counseling, the MDE took the time to patiently explain to her about gestational diabetes and how during pregnancy, due to the various hormonal changes, insulin is unable to function well, thus leading to elevated blood glucose levels. The MDE counseled her that post-delivery, this condition usually resolves. She also counseled her on the care that she should take, and explained about the right way of eating and taking insulin. She gave her an understanding of low glycemic index foods and ways to incorporate them in her diet. The MDE taught her correct hypoglycemia and hyperglycemia prevention and management techniques. By the end of the program, her glucose levels were under control and she had a safe delivery.

Ms. Papia Ghosh

NDEP and T1DE Certified Diabetes Educator

Here's what MDE Papia Ghosh had to say:

With constant support, counseling, and guidance, she acquired the necessary knowledge about diabetes and her blood glucose levels improved. Her fasting blood glucose came down to 101 and random blood glucose level dropped to 111 during the third trimester. She is currently enjoying motherhood with her baby.

MyCARE

With me, every step of the way

20 weeks personalised and hand-holding support for people with diabetes initiated with Insulin.
Aims to empower PWD* with information and knowledge they need to
ensure a better quality of life while managing their diabetes.

MyCARE Service available at Ahmedabad, Bangalore, Bhopal, Bhuvaneshwar, Burdwan, Chandigarh, Chennai, Cochin, Coimbatore, Delhi, Guwahati, Hubli, Hyderabad, Jaipur, Jodhpur, Kolkata, Lucknow, Ludhiana, Madurai, Meerut, Mumbai, Mysore, Nagpur, Patna, Pune, Siliguri, Surat, Thiruvananthapuram, Varanasi, Vijayawada, Visakhapatnam
*PWD: People with Diabetes

Contact for more information
Nikita Thawarkar | 7304930643 | nikita.thawarkar@usv.in

In T2DM Uncontrolled on DPP4i + Metformin, SGLT2i + Metformin, SGLT2i + DPP4i,

Uptitrate with

UDAPA-Trio

Dapagliflozin 10 mg + Sitagliptin 100 mg + Metformin 500 mg XR

UDAPA-Trio Forte

Dapagliflozin 10 mg + Sitagliptin 100 mg + Metformin 1000 mg XR

IMPROVED iCARE STARTS WITH U

Cardio Benefits | **A**1C Control | **R**enal Benefits | **E**nsures Adherence

Abridged Prescribing Information

Indication: It is indicated as an adjunct to diet and exercise to improve glycaemic control in adults with type 2 diabetes mellitus.
Dosage and Administration: The recommended dose is one tablet daily. Each tablet contains a fixed dose of dapagliflozin, Sitagliptin and Metformin Hydrochloride.
Adverse Reactions: Most common adverse reactions reported are: Dapagliflozin- Female genital mycotic infections, nasopharyngitis, and 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; Hypoglycaemia; 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; Hypoglycaemia when used in combination with other anti-hyperglycaemic medicinal product; Renal impairment; Hypersensitivity reactions including anaphylaxis, angioedema, and exfoliative skin conditions- Stevens-Johnson syndrome, Bullous pemphigoid. Metformin Hydrochloride: Lactic acidosis; In case of dehydration (severe diarrhoea 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, Hepatic Impairment, Acute Alcohol intoxication, alcoholism
Use in a special population: Pregnant Women: Due to lack of human data, drug should not be used during pregnancy. Lactating Women: It should not be used during breastfeeding. Paediatric Patients: The safety and efficacy of drug has not yet been established. No data are available. Geriatric Patients: In Patients > 65 years, it should be used with caution as age increases.

Additional information is available on request.
Last updated: January 01, 2023

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

USV | Corvette

In Uncontrolled Obese T2DM,

START with,

Glycomet®-GP 1 FORTE

Metformin Hydrochloride 1000 mg SR + Glimepiride 1 mg

Glycomet®-GP 2 FORTE

Metformin Hydrochloride 1000 mg SR + Glimepiride 2 mg

Glycomet®-GP 3/850

Metformin Hydrochloride 850 mg SR + Glimepiride 3 mg

January 2023[1]

ESC*
European Society of Cardiology

Long term continuous usage of High Dose Glimepiride:

Inhibits sEH → Increases EET

Greater Cardiovascular Protection

Meta analysis of 21 well established trials[2]

5% Reduction of Weight Vs Baseline Weight[2]

100% Availability

20-50%# Affordable vs other brands

Appropriate to add along with Newer AHAs

1. Glimepiride use is associated with reduced cardiovascular mortality in patients with type 2 diabetes and chronic heart failure, a prospective cohort study | European Journal of Preventive Cardiology | Oxford Academic (oup.com) 2. Ther Adv Endocrinol Metab 2020. Vol 11:1-12 DOI: 10. 1177/2042018820926000. # Data on file * As compared to non-glimepiride group
EET: Epoxyeicosatrienoic acid; sEH: soluble Epoxide Hydrolase; AHAs: antihyperglycemic agents; T2DM: Type 2 Diabetes Mellitus

Prescribing Information

Information: Metformin hydrochloride (as prolonged release) and glimepiride tablets. Glycomet-GP 0.5/Glycomet-GP 0.5 Forte/ Glycomet-GP 1/ Glycomet-GP 1/850/ Glycomet-GP 2/ Glycomet-GP 2/850/ Glycomet-GP 3/ Glycomet-GP 3/850/ Glycomet-GP 4/ Glycomet-GP 4/850/ Glycomet-GP 1 Forte/ Glycomet-GP 2 Forte/ Glycomet-GP 3 Forte/ Glycomet-GP 4 Forte Abridged Prescribing Information **Composition:** Glycomet GP 0.5mg: Each uncoated tablet contains metformin hydrochloride IP (as prolonged release form) 500mg and glimepiride IP 0.5mg • Glycomet GP 0.5 Forte: Each uncoated tablet contains metformin hydrochloride IP (as prolonged release form) 1000mg and glimepiride IP 0.5mg • Glycomet GP 1: Each uncoated tablet contains metformin hydrochloride IP (as prolonged release form) 500 mg and glimepiride IP 1 mg. • Glycomet GP 1/850: Each uncoated tablet contains metformin hydrochloride IP (as prolonged release form) 850 mg and glimepiride IP 1 mg. • Glycomet GP 2: Each uncoated tablet contains metformin hydrochloride IP (as prolonged release form) 500 mg and glimepiride IP 2 mg. • Glycomet GP 2/850: Each uncoated tablet contains metformin hydrochloride IP (as prolonged release form) 850 mg and glimepiride IP 2 mg • Glycomet GP 3: Each uncoated tablet contains metformin hydrochloride IP (as prolonged release form) 500 mg and glimepiride IP 3 mg. • Glycomet GP 3/850: Each uncoated tablet contains metformin hydrochloride IP (as prolonged release form) 850 mg and glimepiride IP 3 mg. • Glycomet GP 4: Each uncoated tablet contains metformin hydrochloride IP (as prolonged release form) 500 mg and glimepiride IP 4 mg. • Glycomet GP 4/850: Each uncoated tablet contains metformin hydrochloride IP (as prolonged release form) 850 mg and glimepiride IP 4 mg. • Glycomet GP 1 Forte: Each uncoated tablet contains metformin hydrochloride IP (as prolonged release form) 1000mg and glimepiride IP 1mg. • Glycomet GP 2 Forte: Each uncoated tablet contains metformin hydrochloride IP (as prolonged release form) 1000mg and glimepiride IP 2mg. • Glycomet GP 3 Forte: Each uncoated tablet contains metformin hydrochloride IP (as prolonged release form) 1000mg and glimepiride IP 3mg. • Glycomet GP 4 Forte: Each uncoated tablet contains metformin hydrochloride IP (as prolonged release form) 1000mg and glimepiride IP mg. **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

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Interview with Dr. Pradip B. Joshi

Dr. Pradip B. Joshi
MBBS, MD (Medicine), PG Dip. (Rheumatology)
Consultant Physician, Mediclinic, Bhavnagar

Dr. Pradip B. Joshi is a well-known physician currently associated with Mediclinic, Bhavnagar. He has over 25 years of experience in Internal Medicine and has been the Ex-President of the Indian Medical Association (IMA) and the Association of Physicians of India (API), Bhavnagar. He has many publications to his name, also, he has delivered talks at many state and national level conferences. He is known for his attention to accurate diagnosis, and for treating patients empathetically.

Diabetes and Lifestyle

1. Should all individuals diagnosed with type 2 diabetes prioritize lifestyle modifications before considering medications or do both go hand-in-hand?

Ans. Lifestyle modifications are a must but trials have shown that getting early glycemic control benefits patients in the future (legacy effect). Hence, one should start treatment from day 1 of diagnosis of diabetes.

2. How does regular physical activity contribute to better blood glucose control in individuals with diabetes, and what are some strategies to help people incorporate exercise into their daily routines?

Ans. Diet, exercise, and medications are the 3 main pillars of diabetes management. Thirty to sixty minutes of exercise 5 days a week helps control diabetes better. Walking, riding a cycle, swimming, or any other exercise of the patient's liking is fine. One can park a car away from the workspace and make a routine to walk from the parking place to the office; using stairs instead of elevators. These minor changes in daily routine help to incorporate exercise into daily life which makes it easy to follow.

3. **With the popularity of over-the-top (OTT) platforms, many people are staying up late binge-watching shows. How do irregular sleep patterns and late-night screen time affect blood glucose levels?**

Ans. Studies have shown that inadequate and irregular sleep can cause poor diabetes control. Those working night shifts and those who sleep less than 6-7 hours have more chances of developing diabetes. If a person with diabetes does not follow regular sleep patterns then managing it becomes problematic.

4. **What is the role of technology, such as continuous glucose monitoring and mobile apps in helping people with diabetes make informed lifestyle choices and manage their condition more effectively?**

Ans. A continuous glucose monitoring system (CGMS) helps explain to patients about glycemic variations and their relation with specific high glycemic index (GI) foods, stress, and binge eating. They can judge which food raises sugar and how fast and for how long, so they can choose food wisely. CGMS motivates patients to be more physically active as they can document the beneficial effects of exercise on glucose levels. Apps that remind patients about taking pills, calorie counting of food, and keeping sugar logs can help patients and clinicians manage diabetes more effectively.

5. **Many individuals with diabetes struggle with long-term compliance when it comes to lifestyle changes. What strategies or approaches have you found most effective in helping patients maintain sustainable lifestyle modifications over time?**

Ans. The most important strategy that works is practicing what I advise my patients. If they see me walking or riding a cycle in a public space, they get motivated. Other ways of influencing them involves arranging public awareness talks about the benefits of regular exercise and the benefits of following a healthy lifestyle.

Staying Hydrated with Diabetes

Dr. Pratiksha Patil

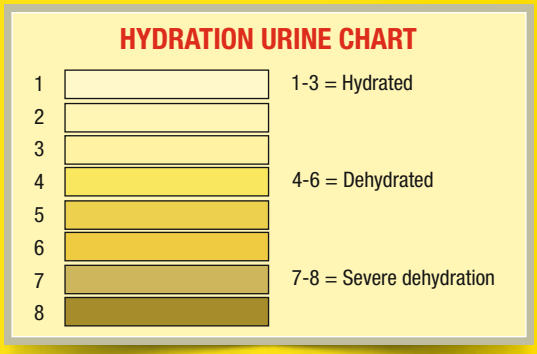
MBBS, D. Diabetology, FCPS (Medicine)
Consultant Diabetologist,
Pratham Speciality Clinic, Mumbai

Water is a primary component of the human body and has many roles to play. It serves as a lubricant, shock absorber, solvent, reactant, carrier of nutrients and waste products, and helps with thermoregulation. Even with its acknowledged significance, water is sometimes disregarded and overlooked. Inadequate water intake can have significant consequences for individuals with diabetes.

Uncontrolled blood glucose levels lead to dehydration because the kidneys then excrete the sugar in the urine. This explains why and when blood glucose levels are too high; people with diabetes often experience increased thirst and perhaps do not drink enough water. Elevated blood glucose levels can pull water out of the cells, contributing to dehydration. Certain diabetes medications and infections can exacerbate fluid loss. Additionally, gastroparesis, a condition associated with diabetes, can make it challenging to consume enough fluids. To prevent dehydration, it's crucial for individuals with diabetes to monitor their blood glucose, maintain a balanced diet, and drink enough fluids to stay hydrated.

Tips to get enough water

- Prior to every meal and as soon as one wakes up in the morning, one must make sure to have a glass of water.
- Examine the color of the urine to assess hydration status. It should ideally be transparent or pale yellow in color. If it is darker, it implies that the individual is dehydrated and needs to drink more water.
- Reminders on fitness trackers/apps help to ensure frequent intake of water.



- Having a dedicated bottle for oneself rather than sharing it from common water storage helps to track the amount of water consumed by an individual.
- Fruits and vegetables provide about 20% of the fluid that humans require. Consider including one fruit a day, as well as vegetables and herbs, such as mint or cucumber.
- One needs to drink more water when it is hot and humid, especially while exercising.

- Alcohol and caffeinated beverages should be avoided, as both caffeine and alcohol act as diuretics and may lead to dehydration.

Resources:

1. Watts M. Dehydration and diabetes. *Diabetes*. April 5, 2023. Accessed October 30, 2023. Available at: https://www.diabetes.co.uk/dehydration-and-diabetes.html#google_vignette.
2. Why you should drink more water | ADA. Accessed October 30, 2023. Available at: https://diabetes.org/food-nutrition/eating-healthy/why-drink-more-water.
3. Jéquier E, Constant F. Water as an essential nutrient: The physiological basis of hydration. *European Journal of Clinical Nutrition*. 2009;64(2):115-123. doi:10.1038/ejcn.2009.111

Role of Exercise in Type 2 Diabetes (T2DM)

Dr. Lijo George

MBBS, MD (General Medicine), PGDHSc, C. Diab.

Consultant Physician and Diabetologist,
MIT Hospital, Kodungallur, Kerala

Exercise is a key element in the prevention and management of type 2 diabetes (T2D). It is now widely known that regular participation in physical activity (PA) improves blood glucose control and can prevent or delay T2D, along with positively affecting lipids, blood pressure, cardiovascular events, mortality, and quality of life. Both aerobic and resistance exercises offer unique opportunities for good glycemic control.

Benefits of Different Exercises in Type 2 Diabetes (T2D)

Training type	Frequency	Duration	Benefits in adults (of all ages) with T2D
Aerobic (Walking, jogging, cycling, swimming, aquatic activities, dancing, and interval training)	Three to seven days per week with no more than 2 consecutive days between bouts of activity	Minimum of 150 to 300 minutes per week of moderate activity or 75 to 150 minutes of vigorous activity or an equivalent combination	Improves insulin sensitivity and glycemia via increased insulin-stimulated glucose disposal and suppression of hepatic glucose production. Improves lipids, blood pressure, other metabolic parameters, and fitness levels
Resistance (free weights, machines, elastic bands, or body weight as resistance; undertake 8-10 exercises involving the major muscle groups)	2-3 days per week but never on consecutive days	10-15 repetitions per set and 1-3 sets per type of specific exercise	Ten to fifteen percent improvements in strength, bone mineral density, blood pressure (BP), lipid profiles, skeletal muscle mass, and insulin sensitivity. Combined with weight loss, resistance training may increase lean skeletal muscle mass and reduce A1c (glycated hemoglobin) by three-fold
Combined	Since exercise-induced improvements in insulin action are temporary, all adults with T2D should adhere to the same guidelines with intervals of no more than two days between bouts, unless their age or comorbid conditions make it more difficult for them to be active and require adjustments.		A greater reduction in A1c has been observed in adults with T2D, undertaking a combined training program compared with either type alone.
Anaerobic high-intensity interval training (HIIT)			Significantly improves fitness levels, reduces A1c and body mass index (BMI), enhances insulin sensitivity and pancreatic β-cell function, and reduces post-prandial hyperglycemia.

Precautions during exercise

1. **Hypoglycemia:** To prevent hypoglycemia during a workout when taking insulin or medication like insulin secretagogues (sulfonylureas and meglitinides), depending on the intensity of the workout, it is important to have a snack containing carbohydrates before and/or while doing the workout. It is not necessary to adjust the dosage or carbohydrate intake for non-insulin injectables, such as glucagon-like peptide-1 (GLP-1) agonists or other oral diabetes medications. Frequent monitoring of blood glucose levels before, during, and several hours after exercise helps one to understand the body's reaction to exercise, and can help to plan the meals accordingly to lower chances of hypoglycemia.
2. **Hyperglycemia:** According to clinical consensus recommendations, exercise should be done with caution if blood glucose is greater than 300 mg/dL. Nevertheless, people are recommended to only start modest exercise if they are asymptomatic and adequately hydrated if their blood glucose is elevated. Short-duration high-intensity training (HIIT) has the potential to temporarily raise blood glucose levels, which may then prolong for a while. Although, most of the time no therapy is required, post-exercise glucose increase can be decreased with the administration of extra insulin (in users) and/or a lower-intensity cool-down after intensive exercises.
3. **Prevent post-meal glucose spike:** Research indicates that exercise after a meal improves glucose regulation by reducing sudden spikes in blood glucose. Regardless of the type or intensity of the exercise, higher energy expenditure after a meal also lowers blood glucose, with longer exercise sessions (≥45 min) consistently yielding the greatest benefits.

Regular exercise is essential to improve glucose levels as well as other cardio-metabolic risk factors. There is evidence to show that activities that favor better glycemic control include taking breaks between long periods of sitting at least every 30 minutes, scheduling workouts after meals, and incorporating some form of aerobic and high-intensity resistance exercise in the week.

Resources:

1. Kanaley JA, Colberg SR, Corcoran MH, *et al.* Exercise/physical activity in individuals with type 2 diabetes: A consensus statement from the American College of Sports Medicine. *Med Sci Sports Exerc.* 2022;54(2):353-368. doi:10.1249/MSS.0000000000002800
2. U.S. Syeda A, *et al.* The importance of exercise for glycemic control in type 2 diabetes. *American Journal of Medicine Open.* 2023;(9). Available at: https://doi.org/10.1016/j.ajmo.2023.100031

Frequently Asked Questions

Dr. Sarthak Gandhi

MBBS, FCCCM, D. Diabetes, D. Endocrine (UK)

Consultant Diabetologist and Endocrinologist, Gandhi Diabetic Care Clinic, Surat

1. My son who is 28 years old is diagnosed with type 2 diabetes. He is very fond of puris, so I went to the market and came across diabetes-friendly oil. Can I use this oil to fry puris for him? Will it cause less harm?

Ans. Every oil differs in the type of fatty acids it is made up of. So, all oils have different benefits. However, the quantity of fat in all oils is the same and thus, they all give the same calories. There is no such thing as a safe oil. All oils need to be consumed in limited quantities. One must stick to 3-4 teaspoons of oil in a day or ½ liter of oil per person in a month. You can rotate your oils or use a commercial blend of oils to get a balance of all essential fatty acids but you still need to stick to the total quantity mentioned above. Occasionally frying puri at home is healthier than eating out. Oils need to be used judiciously keeping the whole day's budget in mind.

2. I am a 16-year-old girl with type 1 diabetes mellitus. Recently, my blood glucose levels have been deranged despite following a diet and regular insulin schedule. The past few weeks have been very hectic for me as I stay up late at night to complete college assignments. My doctor has advised me to sleep on time. Is there any association between the two?

Ans. Your sleeping patterns can have an impact on many aspects of your health, including your weight, immune system, and even how well your brain functions. In addition, it also plays an important role in managing your blood glucose. Studies have shown that lack of sleep/disturbed sleep can also affect your glucose levels, as being awake at night can make your cells more resistant to insulin by disturbing your body's biological clock, i.e. your circadian rhythm. Lack of proper sleep also leads to excessive hunger and unwanted snacking during the day, which then affects the blood glucose levels. Thus, it is important to get a good night's sleep.

3. I have been diagnosed with diabetes recently. I am trying to control my diet and lifestyle but, I was very fond of the aerated drinks earlier. Now that I have been diagnosed with diabetes, do I need to shift to diet sodas?

Ans. Diet sodas are typically sweetened with one of the artificial sweeteners, mostly aspartame. The safety of consuming artificial sweeteners frequently is a concern. Also, sodas contain caffeine and phosphoric acid which are associated with other complications like dehydration, dental and bone issues, and reflux. Instead of frequently consuming diet soda, look for healthier alternatives that are safe. You can choose unsweetened iced or hot tea, infused water, low-fat milk, buttermilk, unsweetened lemon juice, or any vegetable juice.

4. My son, who is 12 years old is diagnosed with type 1 diabetes. He is taking rapid-acting insulin before meals. He wishes to join basketball classes in school at 5 p.m. I am worried as I fear he will have hypoglycemia if he plays a sport, since he is on insulin. Please advise, should I let him join these classes?

Ans. Yes, you must let him pursue whatever sport he likes. Type 1 diabetes is a lifelong condition that can be managed. It should not hamper his growth and development in any way. You just need to take certain precautions, to avoid any hypoglycemic episodes. He is on rapid-acting insulin, so by 5 p.m., the action of the insulin in the body will be almost over as he would have taken the injection pre-lunch. Make sure he eats a 15-20 g carbohydrate snack like fruits and nuts or paneer wrap before the classes. Initially when he joins make sure you monitor his sugars before, during, and after the workout to understand how this new activity affects the blood glucose levels. Keep the doctor informed, so that the doctor can make dose adjustments of basal and bolus insulin if needed. Always provide him with a hypo kit which includes 15 g of fast-acting carbohydrates like sugar to correct the low glucose if there is a hypoglycemic event. Keep the coach informed about his diabetes. These precautions will help to minimize the risks and he can play the sport he loves.

Diabetes Educator Tip of the Month

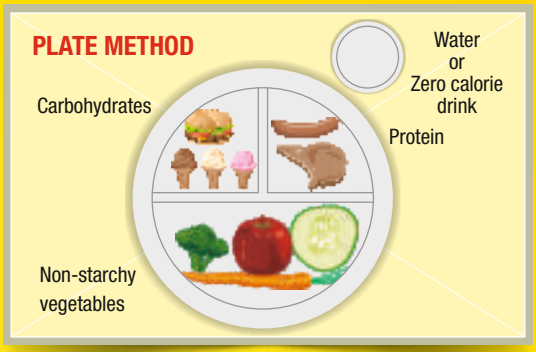
Contributed by
Name: Ms. Samrin Khan

Masters in Clinical Nutrition and Dietetics, Specialized in Diabetes and Cardiac Nutrition and Certified Diabetes Educator

Tips for portion control

Controlling portion sizes is important for people with diabetes to help manage blood glucose levels and maintain a healthy weight. Here are some dietary tips to help control portion sizes.

1. **Choose smaller plates:** Using smaller plates can assist in avoiding overindulgence by making the portions appear larger.
2. **Fill half the plate with non-starchy vegetables:** Non-starchy vegetables such as leafy vegetables, green beans, carrots, broccoli, etc., are low in calories and carbohydrates. They can aid in achieving a sense of fullness and satisfaction while maintaining stable blood glucose levels.
3. **Practice the plate method:** Divide the plate into sections. Fill half with non-starchy vegetables, one-quarter with protein or lean meat, and one-quarter with whole grains. This method helps control portion sizes and balances the macronutrient intake.



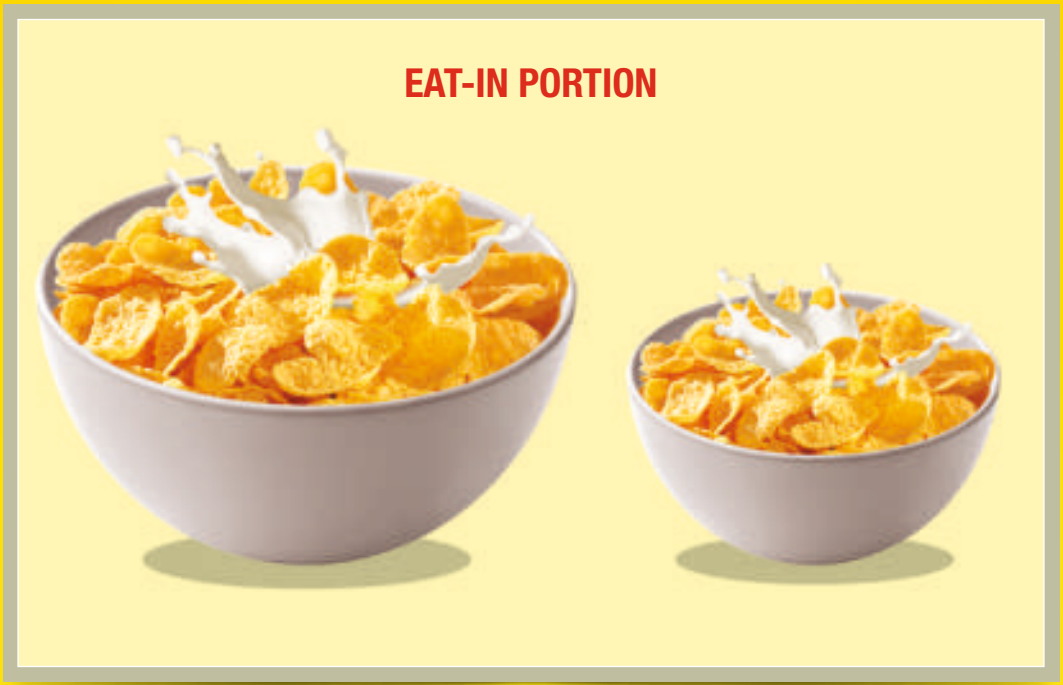
4. **Use measuring tools:** Use measuring tools for precise portion control. This can help to stick to the recommended serving sizes.
5. **Monitor snack portions:** Snacks can contribute to the daily calorie and carbohydrate intake. Pre-portion snacks into smaller containers instead of directly eating out of the packet to avoid mindless eating. Choose healthy snacks like nuts, seeds, fresh fruits, vegetables, etc.
6. **Avoid second helping:** Before going for seconds, pause to assess if there is still genuine hunger. Overeating becomes more likely when not attentive to one's body's hunger signals.

7. **Slow down:** Eating too quickly can make it difficult to recognize fullness. Chewing food slowly and savoring each bite can assist in preventing overeating.
8. **Listening to hunger and fullness cues:** Recognizing bodily cues for hunger and fullness is essential for preventing overeating and achieving optimal portion control.
9. **Stay hydrated:** Sometimes, thirst is mistaken for hunger. Drink water before a meal to help control the appetite.

Remember that portion control is an essential aspect of diabetes management, but individual needs may vary. It is important to consult a qualified dietitian to create a personalized meal plan that suits the diabetes management goals and dietary preferences.

Resources:

1. Diabetes UK. Portion sizes and diabetes. Available at: https://www.diabetes.org.uk/guide-to-diabetes/enjoy-food/eating-with-diabetes/portion-sizes
2. Centers for Disease Control and Prevention. Diabetes meal planning. Available at: https://www.cdc.gov/diabetes/managing/eat-well/meal-plan-method.html



Dia-Games

Find the odd one out

1. Sleep, Diet, Insulin, Smoking
2. Meditate, Exercise, Play a Sport, Drink Coffee
3. Walking, Jogging, Running, Weightlifting
4. Apple, Pear, Mango Juice, Guava
5. Chiaseeds, Cheese, Walnuts, Flaxseeds
6. High Fiber, High Fat, Low Glycemic Index (GI), Low Glycemic Load (GL)
7. Eating Slowly, Eating Mindfully, Skip a Meal, Portion Control
8. Buttermilk, Fruit Juice, Sugarcane Juice, Iced Tea

Answers

1. Insulin: All other are the components of lifestyle
2. Drink Coffee: All others are ways to reduce stress
3. Weightlifting: All others are aerobic exercises
4. Mango Juice: Not recommended for diabetes
5. Cheese: All others are sources of omega-3 fats
6. High Fat: All other diets are recommended for diabetes
7. Skip a Meal: All others are recommended for people with diabetes
8. Buttermilk: Has the least impact on blood glucose levels

Beat Diabetes
Win Life

For screening people with High & Moderate Risk of Diabetes

Indian Diabetes Risk Score

Share this simple test with your family & Friends

Users can share it with their family & friends

Video on Suggestive Lifestyle Interventions to minimise risks - for each category

12 Languages

An awareness initiative by USV

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Accessible to Every INDIAN

For Screening people with High & Moderate Risk of Diabetes

TO KNOW YOUR RISK OF DIABETES SCAN HERE

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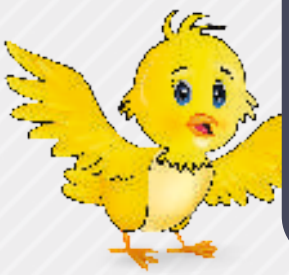

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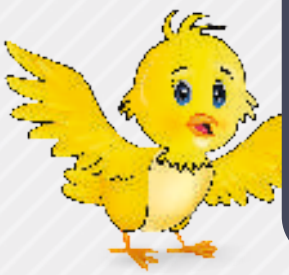
TO KNOW YOUR RISK OF DIABETES SCAN HERE



Beat Diabetes Win Life

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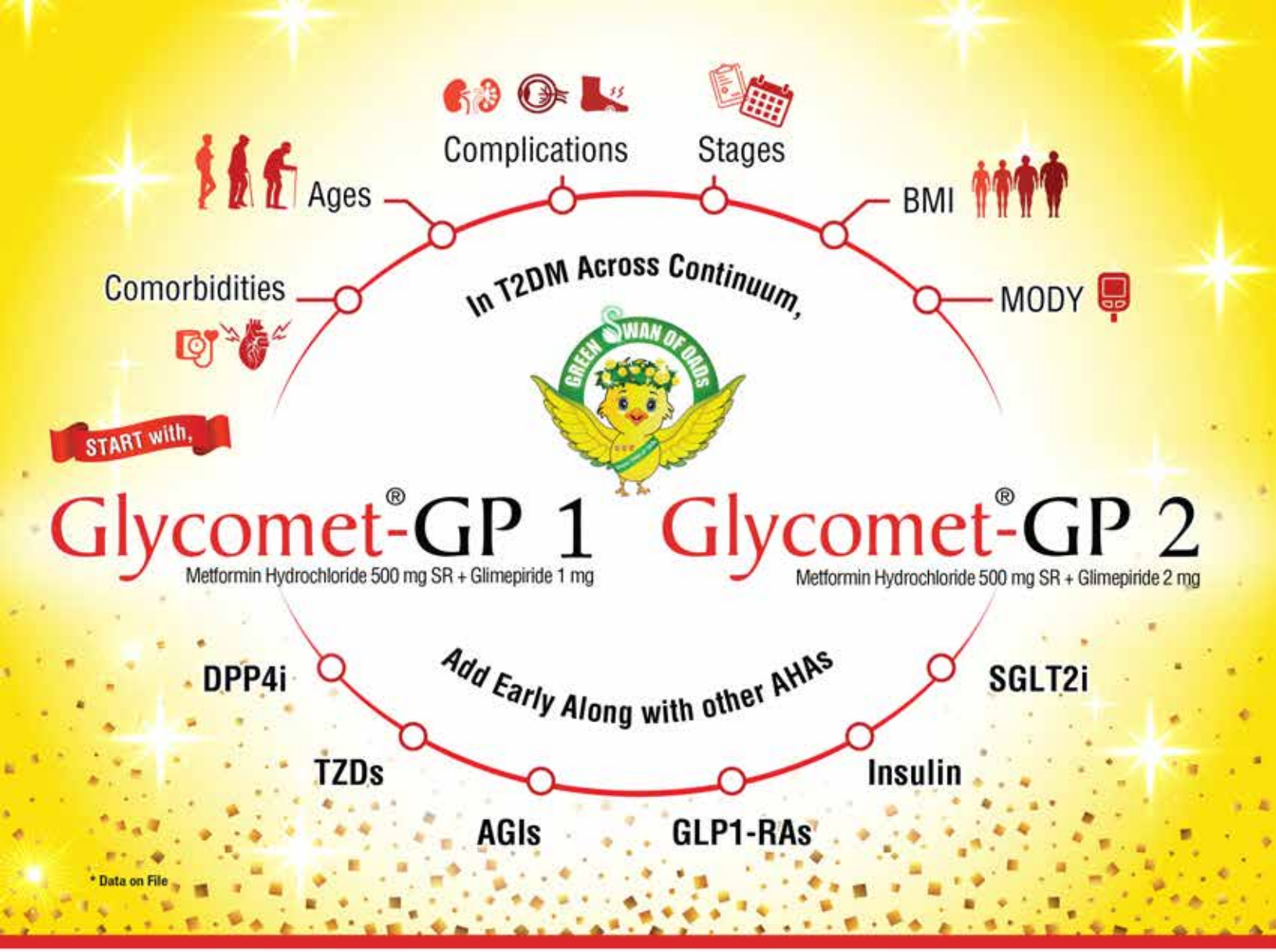

1. Asian Journal of Diabetology, Vol. 23, No. 2, April-June 2022: YALAMANCHI SADASIVA RAO etal, 2. Asian Journal of Diabetology, Vol. 23, No. 2, April-June 2022; SAUMITRA RAY etal, 3. Cureus 2020; 12(9): e10.7759/cureus.1070 4. CMARC Data 5. Healthplix Data 6. Lim L-L, Lau ESH, Cheung JTK, et al. Real-world usage of sulphonylureas in Asian patients with type 2 diabetes using the Joint Asia Diabetes Evaluation (JADE) register. Diabetes Obes Metab. 2022;1-14. Doi:10. 1111/dom.14865;

Prescribing Information

Information: Metformin hydrochloride (as prolonged release) and glimepiride tablets. Glycomet-GP 0.5/Glycomet-GP 0.5 Forte/ Glycomet-GP 1/ Glycomet-GP 1/850/ Glycomet-GP 2/ Glycomet-GP 2/850/ Glycomet-GP 3/ Glycomet-GP 3/850/ Glycomet-GP 4/ Glycomet-GP 4/850/ Glycomet-GP 1 Forte/ Glycomet-GP 2 Forte/ Glycomet-GP 3 Forte/ Glycomet-GP 4 Forte Abridged Prescribing Information **Composition:** Glycomet GP 0.5mg: Each uncoated tablet contains metformin hydrochloride IP (as prolonged release form) 500mg and glimepiride IP 0.5mg.• Glycomet GP 0.5 Forte: Each uncoated tablet contains metformin hydrochloride IP (as prolonged release form) 1000mg and glimepiride IP 0.5mg.• Glycomet GP 1: Each uncoated tablet contains metformin hydrochloride IP (as prolonged release form) 500 mg and glimepiride IP 1 mg. • Glycomet GP 1/850: Each uncoated tablet contains metformin hydrochloride IP (as prolonged release form) 850 mg and glimepiride IP 1 mg. • Glycomet GP 2: Each uncoated tablet contains metformin hydrochloride IP (as prolonged release form) 500 mg and glimepiride IP 2 mg. • Glycomet GP 2/850: Each uncoated tablet contains metformin hydrochloride IP (as prolonged release form) 850 mg and glimepiride IP 2 mg.• Glycomet GP 3: Each uncoated tablet contains metformin hydrochloride IP (as prolonged release form) 500 mg and glimepiride IP 3 mg. • Glycomet GP 3/850: Each uncoated tablet contains metformin hydrochloride IP (as prolonged release form) 850 mg and glimepiride IP 3 mg. • Glycomet GP 4: Each uncoated tablet contains metformin hydrochloride IP (as prolonged release form) 500 mg and glimepiride IP 4 mg. • Glycomet GP 4/850: Each uncoated tablet contains metformin hydrochloride IP (as prolonged release form) 850 mg and glimepiride IP 4 mg. • Glycomet GP 1 Forte: Each uncoated tablet contains metformin hydrochloride IP (as prolonged release form) 1000mg and glimepiride IP 1mg. • Glycomet GP 2 Forte: Each uncoated tablet contains metformin hydrochloride IP (as prolonged release form) 1000mg and glimepiride IP 2mg. • Glycomet GP 3 Forte: Each uncoated tablet contains metformin hydrochloride IP (as prolonged release form) 1000mg and glimepiride IP 3mg. • Glycomet GP 4 Forte: Each uncoated tablet contains metformin hydrochloride IP (as prolonged release form) 1000mg and glimepiride IP mg. **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

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