

# Journal of Diabetes Education

To Dispel Darkness Of Diabetes

DIET MANAGEMENT ►



◀ EXERCISE



MEDICATION ►



**An Official Publication of  
Association of Diabetes Educators  
(India)**



# JOURNAL OF DIABETES EDUCATION

To Dispel Darkness of Diabetes

Vol. 8

Number 2

April - June, 2020

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# DIABETES AND COVID-19

\* Priyangee Lahiri

If there is one thing that needs to be looked at to make COVID-19 less damaging, then diabetes is undoubtedly one of the top contenders. Diabetes per se does not increase the chance of COVID-19 infection, but people with diabetes are at a greater risk of developing severe COVID-19 complications. It has been reported that risk of dying due to the novel coronavirus infection is 50% higher in patients with diabetes than those without. Uncontrolled hyperglycemia and presence of diabetes-related complications worsens the prognosis of COVID-19 infection. Thus, it is extremely important to achieve good glycemic control in order to mitigate the severity of COVID-19 infection in diabetics.

In India, 60-70 percent of Type 2 diabetics have uncontrolled hyperglycemia, and in a large number of patients, diabetes remains undetected until hospitalization occurs due to diabetes-related complications. Additionally, glycemic control was found to be worsen in many due to poor lifestyle habits during the lockdown.

Again, there are reports of new-onset diabetes in those with COVID-19 infection. It is hypothesized that COVID-19 infection might cause beta-cell injury which causes insulin deficiency in patients without pre-existing diabetes. Also, factors like viral-sepsis induced insulin-resistance, use of corticosteroids to control pro-inflammatory states, reduced contact of patients with their doctor or healthcare workers exacerbate hyperglycemia. Additionally, non-compliance to medications and insulin due to economic problems or unavailability during lockdown further worsened glycemic control in many patients.

Given the current scenario, monitoring and management of diabetes should be intensified to maintain strict glycemic control and reduce morbidity and mortality in COVID-19 patients and all diabetic patients in general. Thus, the role of diabetes educators has become more important than ever in the present situation. Diabetes educators should pro-actively connect with patients and reiterate self-monitoring and

diabetes management strategies at home through tele-consultations.

Additionally, inclusion of diabetologists and diabetes educators in the in-patient COVID management team should be considered for better glycemic management and improved outcome. The diabetes educators can take into account all aspects of hospital-care that impact glycemic control for in-patients, educate and collaborate with the interdisciplinary team members accordingly and help in coordination of care that is required to achieve good glycaemic control.

## Recommendations for people with diabetes in the backdrop of COVID-19

Along with all the measures of preventing COVID-19 infection like hand-washing, disinfection, use of masks and physical-distancing, people with diabetes need to intensify their diabetes monitoring and management strategies as a primary preventive measure. Thus the following advice should be given to all people with diabetes:

- Importance of glucose control, more so than in the non-Covid period should be explained to all.
- Self-monitoring of blood glucose should be emphasized under all conditions.
- Advice regarding diet, exercise and lifestyle modifications should be reiterated and importance of adherence to therapy should be re-emphasized.
- Along with blood glucose control, detection and control of pressure must be emphasized.
- Advice on the importance of weight control and measures for preventing weight gain should be explained. Obese patients are at risk of ventilatory failure during Covid-19 infection and more likely to require mechanical ventilation. Also, there are increasing difficulties in achieving successful ventilation in the obese subjects.
- Encourage the intake of a healthy and balanced diet which is commensurate with

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their body weight, blood glucose levels, medications and/or insulin and minimize the intake of processed foods that might be convenient during the lockdown. A healthy, balanced diet is not only the corner-stone of diabetes management, but also the key to maintaining a healthy immune system. In case of limited availability or accessibility to a wide variety of fresh foodstuffs, professional advice from a registered dietitian should be sought who can help in planning a healthy and individualized diet based on available food ingredients.

- Along with a healthy diet, emphasis on adequate hydration and regular physical activity is important.
- Symptoms of hypoglycemia and its management should be reiterated especially in the elderly.
- All patients at risk of developing foot ulcers should be counseled on foot care and self-examination of feet.
- Access to adequate food and uninterrupted supply of insulin, diabetic medications, needles, blood glucose strips should be ensured especially during lockdown.
- All patients should be advised to observe proper hygienic practices like regular hand washing with soap, avoid touching face and cleaning injection, infusion sites & finger-stick sites with soap and water or by rubbing alcohol.

#### **Recommendations for diabetics with or suspected COVID-19 infection in home isolation**

- Advise patients to check blood glucose more often. In case monitoring (SMBG) at home is not possible, re-educate patients about symptoms of hyper and hypoglycemia and ask them to contact a healthcare provider if symptoms of hyper or hypoglycemia persist.
- Advise patients to have smaller portions of food more often if they have nausea or difficulty in tolerating usual meals. Instruct them to get medical help if there is persistent vomiting.
- Patients should drink lots of fluids to keep themselves adequately hydrated. If there is difficulty or pain during swallowing, they should be advised to take small sips every 15 minutes throughout the day to avoid dehydration.

- Patients should not stop or change any medication or insulin without discussing with the healthcare team.
- Patients should be educated about medications that might affect blood glucose. Many over the counter cough syrups and decongestants can increase blood sugar. Aspirin in large doses might lower blood glucose levels. Paracetamol might affect some CGM sensors.

#### **Recommendations for hospitalized COVID-19 patients with diabetes**

- Blood glucose monitoring should be done more frequently by the diabetes educators.
- Use of Continuous Glucose Monitoring System (CGMS) with real-time sensors is recommended for monitoring.
- Insulin is the preferred glucose lowering agent for most hospitalized patients and is mandatory for critically ill patients.
- Intravenous insulin infusion should be given in cases of high insulin requirement in patients with severe COVID-19 infection.
- Fluid balance should be maintained very carefully to avoid pulmonary edema.
- Hypokalaemia, a common feature of COVID-19 infection gets exacerbated by initiation of insulin. Potassium along with other electrolyte levels should be monitored and care should be taken to maintain electrolyte balance.
- Nausea, vomiting, loss of appetite, mismatched IV fluids, and use of hydroxychloroquine puts the patient at risk of developing hypoglycaemia. Thus, monitoring and prompt correction of hypoglycemia is required.
- Inclusion of a diabetes educator in the hospital healthcare team is of utmost importance to ensure coordination and transition of care from hospital to home. Additionally, in difficult patients, teleconsultations with a diabetologist is likely to improve outcomes.
- At discharge from the hospital, proper counseling and further education regarding self-monitoring and glycemic control at home should be done. Injection technique should be properly explained to patients transitioning to insulin therapy. In order to avoid anxiety regarding insulin use, injection technique



should be properly explained to patients transitioning to insulin therapy.

### **Specific recommendations for various groups**

#### ➤ **Type 1 Diabetes:**

- Type 1 diabetic patients with COVID-19 are prone to developing severe DKA which is worsened due to delay in hospital admission. Therefore, monitoring should be intensified in patients to prevent acute complications like DKA.
- All patients should be educated about diabetic ketoacidosis and its typical symptoms and self-management of early DKA.
- Insulin should never be stopped under any circumstances.
- Blood glucose and ketones should be monitored more frequently. Checking blood glucose every 4 hours, including at night is recommended. Extra insulin might be required to bring down blood glucose if levels are high.
- If two consecutive blood glucose readings are above 250mg/dl, urine ketones should be checked. If urine ketones are trace or small, give plenty of fluids to ensure adequate hydration and recheck within a few hours. If urine ketones are moderate or large, and if there is nausea, vomiting or abdominal pain, immediate medical help should be sought as DKA is likely.

#### ➤ **Pregnancy in diabetes and GDM:**

- Blood glucose should be intensively monitored with SMBG and CGMS and managed appropriately.
- Screening for GDM should be done with capillary blood glucose in order to prevent laboratory visits.
- Consultations with gynecologist for antenatal checks, diabetologists, dietitians and diabetes educators should be done through tele-consultations, if in-person visit is not feasible.

#### ➤ **Patients who have undergone pancreas or islet-cell transplantation:**

People with islet-cell or pancreas transplantation become insulin-independent after the transplant. However if they contract a COVID-19 infection, they need to be monitored for recurrence of insulin requirement.

#### ➤ **Diabetic patients with concomitant Fatty Liver Disease:**

These patients are at risk of developing severe COVID-19 disease due to higher inflammatory responses. These patients should be screened for hyper inflammation using parameters like hs-CRP (high-sensitivity C-reactive protein, a marker of systemic inflammation), ESR, serum ferritin, and platelet count.

#### **Advice for patients without diabetes**

- All individuals without diabetes, especially those with metabolic risk factors should be advised on healthy lifestyle habits, diet, exercise and weight management. Those with metabolic and behavioral risk factors should get screened for diabetes.
- All patients without diabetes diagnosed with COVID-19 should be screened for high blood glucose levels.

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# DIETARY MANAGEMENT IN CHILDHOOD INSULIN-DEPENDENT DIABETES

\* Saurabh Uppal

The modern approach to the management of Childhood Insulin Dependent Diabetes Mellitus (IDDM, Type 1 DM) places equal emphasis on the quantity and quality of diet in addition to a routine diet prescription. This marks a deviation from the traditional approach which is heavily insulin-centric or body weight-centric with a fixed dietary pattern and limited dietary advice. The present approach aims to align the insulin dosage to the dietary intake and the lifestyle of the child rather than adjusting dietary intake as per the insulin dose advised. The traditional approach indirectly encourages an arbitrary change of insulin dose as per blood glucose levels done by caregivers who usually lack any formal training in dose adjustment and are driven by their own bias. This fundamental change in our approach to the management of childhood diabetes has come about with the widespread acceptance of *basal bolus therapy* with multiple daily doses of insulin by the medical as well as the patient community. The choice between a fixed and a flexible regimen of insulin dosage and dietary intake now depends on the patient preference. This modern approach is more likely to succeed in children with flexible lifestyles and wide variations in appetite and daily food choices. It requires an effort to estimate the total carbohydrate content in the diet and administering the instantaneously calculated dose accordingly. Further refinements in the dose calculation to account for the fat content and the protein content of the meal are tailored to the individual needs as well as the respective cultural dietary practices and commensurate with the requirement for child's growth.

## Do children with diabetes have different nutritional needs?

Growing children have specific nutritional requirements. As with non-diabetic growing children, those with diabetes do not have nutritional requirements that are any different.

Modern recommendations for children with diabetes are centered around healthy eating habits which apply to any growing child. The recommendations apply to the entire family as they would to any other family. Therefore, the label "diabetic diet" applied to the nutritional advice given to families of children with diabetes is to be discouraged.

## How should a child with diabetes eat; ideal meal composition:

Every child is different. There cannot be a single dietary recommendation that fits all. The diet prescription should be made keeping in mind the appetite of the child, the stage of growth, activity level, personal lifestyle and preference, as well as how the child's body responds to different foods. The diet plan should always be constituted in discussion with parents and after noting the child's schedules and preferences (with concomitant blood glucose readings and food analysis).

The sufficiency of energy intake can be gauged by regular growth monitoring in children with Type 1 diabetes. There is sufficient evidence available that highlights the fact that the overall carbohydrate content in a meal is the most prominent factor in determining the post-meal blood glucose excursion and hence the most important factor in calculating the pre-meal bolus insulin dosage. Studies demonstrate that diabetes management when done by incorporating carbohydrate counting and insulin-to-carbohydrate ratio to ascertain the dosage of insulin resulted in more satisfied patients with a reduction in HbA1c levels. Even if the family is not following advanced carbohydrate counting and children continue on fixed-dose insulin regimens, consistency of food intake especially in terms of carbohydrate content is the most important factor for good glycemic outcomes in the short term as well as the long term.

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For most children, carbohydrates should make up for 45-60 % of the day's calories. Distribution of the above-calculated carbohydrates in different meals should be done in a balanced way to prevent excessive intake at any one time of the day and also to limit the carbohydrate intake during snacks, when children usually do not inject insulin. Distributing carbohydrates throughout the day helps provide satiety and avoids intense hunger thereby guarding against compulsive and defensive eating which are common obstacles in achieving good glycemic control. It is important to note that combining carbohydrates with different amounts of protein and fat can have varying effects on blood glucose levels. The recommended percentages of different macronutrients are as in Table 1.

**Table 1: Recommended percentages of macronutrients in regular balanced diet.**

Carbohydrate	50 to 55% Sucrose intake upto 10% of total energy
Fat	25 to 35% Less than 10% saturated fat + trans fatty acids Less than 10% polyunsaturated fat More than 10% monounsaturated fat (upto 20% of the total energy)
Protein	15 to 20%

Source: ADA, 2005

The percentage recommendation serves as a good reference point for ongoing care. It is a good practice to review diet in children with diabetes at each follow-up visit to fine-tune the advice to the child's lifestyle & keeping in mind preferences and the limitations of the family as well as how the child's blood glucose responds to different foods.

### **How frequently should a child with diabetes eat? ideal meal spacing:**

Evolved knowledge of bolus, insulin therapy and its pharmaco-kinetics enables us to plan

ideal spacing between meals. However quite often poor education about diabetes and fear of hypoglycemia drives families and kids to eat throughout the day. The ideal gap between successive food intake should be a minimum of 3 hours, eg. If the breakfast is at 8 am, the snacks and lunch meal should be at 11 am at 2 pm respectively. This suggested minimum gap is to allow for the insulin action from the previous bolus dose (2-3 hours with rapid-acting insulin) to bring down the blood glucose excursion after the meal. The time required to reduce the blood glucose levels also depends on the type of meal taken (glycemic index and fat content) but a minimum gap of 3 hours is suggested regardless of the type of food taken to prevent insulin stacking. Stacking of insulin occurs if you give an insulin correction within three hours of a previous correction. Emotional bolusing means you know what the outcome is going to be - low glucose- but you cannot stop yourself. You cannot stand to see the high number stay there!

### **‘Matching’ food intake with insulin dosage**

Matching the dose of bolus insulin to the intake of carbohydrates while the patient is on intensive insulin regimen provides more flexibility in terms of intake of carbohydrates and the timing of meals which in turn creates more possibilities for better blood glucose levels and enhanced quality of life. Carbohydrate counting is based on the evidence that overall carbohydrate content of the food intake is the predominant factor in deciding the postprandial glucose response and hence becomes the basis for ascertaining the pre-meal dosage of insulin. A majority of carbohydrates have most of their impact on increasing blood glucose levels within 1-2.5 hours of their ingestion (although complex carbohydrates are slowed down further by their interactions with protein and fat). This duration of effect corresponds, albeit not exactly, to the duration of maximal action of rapid-acting (and short-acting) insulins. Hence by titrating the insulin dosage to the carbohydrates taken, the post-meal blood glucose excursions beyond the target range can be avoided.



## There are two approaches to meal planning using carbohydrate counting

1. *Following a consistent meal plan* with a pre-decided and fixed number of carbohydrates with a consistent amount of insulin given as a bolus. This is a good practice to start with, especially in newly diagnosed patients or carbohydrate-counting naive families. Further modification of the method to a more flexible approach may be done as per the caregiver's motivation, education level, and understanding.
2. *Having flexibility in changing carbohydrate intake* and adjusting the dose according to the number of carbohydrates in the meal. This method is the preferred method in motivated and educated families and gives both the physician and the family greater flexibility in titrating insulin doses for better outcomes as well as managing eating behaviour and preferences of the child

How much carbohydrate-containing food should a child with diabetes consume: ideal meal quantity?

Advice on the number of carbohydrate units to be taken by a child at different meals should be highly individualised depending on the child's age, growth needs, gender, activity level, and additional specific needs if any. However, a general example of the estimated intake by age group is as below

Table 2: Estimated Carbohydrate amount by age			
Boys	<5 years old 30-45 carbs at each meal	5-12 years old 45-60 carbs at each meal	>12 years old 60-75 carbs at each meal
Girls	30-45 carbs at each meal	45-60 carbs at each meal	45-75 carbs at each meal

Source: ADA, 2015

The number of carbohydrates taken at snack times should be calibrated to the needs of the individual child based on the impact on glycemic excursions and taking into account if the child

takes added bolus insulin at snack times. A decision to this effect should only be taken after analysis of blood glucose patterns around snacking time.

## Adjusting for the carbohydrate intake; using the Insulin to Carbohydrate Ratio (ICR)

Insulin to Carbohydrate ratio (ICR) is defined as the total carbohydrates in grams covered by 1 unit of rapid or short-acting insulin given as a bolus at mealtime. It depends primarily on the TDD (Total Daily Dose) of the child. A good starting point to calculate ICR is the 500 rule. Dividing 500 by the TDD gives an estimate of total grams of carbohydrates covered by a bolus of 1 unit of fast-acting Insulin. As an example, if the estimated TDD of insulin required to achieve a reasonable control in a 15-year-old child is 50 units, the ICR would be calculated as follows

$$500 \text{ Divided by } 50 \text{ (i.e the TDD)} = 10 \\ \text{(i.e the ICR)}$$

Therefore, if this child is taking 50 carbohydrates in a meal, he would require 5 units of rapid or short-acting insulin to compensate for the blood glucose excursion caused by the 50 carbohydrates in that meal.

It is important to note that the 500 rule is empirically derived from studies in adults and just provides an empirical starting estimate of the ICR. The actual ICR should be *titrated to effect*, depending on the post-meal blood glucose values.

- For frequent lows after meals, increase the ICR
- For frequent highs after meals, lower the ICR

Fine-tuning an ICR is a continuous process and the initial calculated ICR is by no means comprehensive and constant.

## The effect of Glycemic-Index of carbohydrate-containing food.

Different studies have shown that it is the amount of carbohydrate rather than the complexity of carbohydrate that dictates the total insulin dose required. However, the advent

of continuous glucose monitoring has shown notable differences in the timing of post-meal blood glucose excursion between low and high glycemic index foods including increased incidence of mild post-meal hypoglycemia with low GI foods if the insulin dose is not advanced further closer to the meal.

Proposed strategies to compensate for glycemic index of food include preponing or delaying the timing of pre-meal bolus of rapid-acting insulin to compensate for high and low glycemic index foods respectively in patients on Multiple Dose Insulin's (MDI's) and giving insulin as a 50:50% dual wave bolus in patients on Continuous Subcutaneous Insulin Infusion (Insulin Pump). The mismatch between the action of analogue insulins and the rapid glucose spike caused by high-GI meals remains a clinical challenge and needs the development of practical dosing strategies to address it. Till date, very limited studies have investigated adjustment of the total dose of Insulin for the glycemic index of food.

Good dietary management and nutritional support is the cornerstone of therapy for childhood diabetes. Regular and adequate focus on diet and nutrition during follow up can play an important role in ensuring better outcomes in these children.

### **Recommended 'Good eating Practices' for families and children with diabetes**

1. Regularity in meal times
2. Family participation in establishing better eating practices such as
  - Sitting down together to eat.
  - Monitoring of food intake across all family members
3. Ensuring presence in the meal of all macronutrient and micronutrient groups.
4. Avoiding binge eating and taking a moderate amount of carbohydrates at each meal.
5. Filling at least half the food plate with vegetables and healthy salads

6. Taking the dose of insulin at the recommended time before taking food
7. Avoiding late-night dinners and snacks
8. Eating home-made foods most of the time and minimizing eating out.
9. When eating out, replacing regular side-dishes with vegetable-based servings
10. Inculcating the habit of reading food labels and choosing healthier food options.
11. Snacking on nuts and seeds rather than biscuits and packaged/processed snacks.
12. Increasing water intake (to help the child feel 'fuller')
13. Rewarding good food choices and healthy eating behaviour of the child.

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# SELF-MONITORING OF BLOOD GLUCOSE (SMBG): A BEHAVIOUR CHANGING TOOL

\* Vimal Pahuja

## Introduction:

Diabetes is a chronic progressive disease of myriad pathophysiological defects leading to multitude macro and micro-vascular complications. The mainstay of diabetes management is lifestyle change along with medications, education and self-monitoring of blood glucose (SMBG).

SMBG is a very effective monitoring tool which has shown significant reduction of glycated haemoglobin in patients with Type 1 and Type 2 diabetes mellitus on insulin or Type 2 without insulin therapy. The structured SMBG (sSMBG) helps in promoting behaviour changes and has been useful in transitioning of diabetes care from physician alone to the patient and empowering patients to get optimum control over their diabetes. The diabetes educator has a vital role to play in educating patients about sSMBG and its importance as a part of the educational exercise and is an integral and important pillar of Diabetes Self-management and Education (DSME).

## Background:

Diabetes is a chronic progressive disorder and is increasing exponentially in developing countries, especially in countries like India and China. There are a multitude of complications associated with diabetes, both microvascular and macrovascular leading to considerable morbidity and mortality also coupled with economic and social issues. Good glycemic control is known to prevent micro and microvascular complications as shown in the literature.

The backbone of diabetes management is lifestyle changes and as well as behaviour changes to be adapted by diabetic patients. In real world this is difficult to sustain consistently.

The plethora of anti-hyperglycaemic therapies available for diabetes have not been able to meet the target of glycemic control as recommended by the world's diabetes organisations.

Besides the complex pathophysiology of Type 2 diabetes and ever progressive nature of the disease, poor adherence to the prescribed lifestyle, poor knowledge about the disease and lack of monitoring are a few other reasons for not achieving good glycemic control. The patients have to be actively involved and diabetes care should be made patient-centric in order to achieve the desired results.

The monitoring tools to measure glycemic control are mainly HbA1C and Self-monitoring of blood glucose (SMBG) along with continuous glucose monitoring devices (CGMS). SMBG is important and an integral part of self-management education in diabetes and if used effectively can lead to a reduction in glycated haemoglobin.

SMBG if structured in the right way can help patients to understand about their response to therapy in conjunction with diet and gives biofeedback in real time thus helping to adhere to both the therapy and prescribed lifestyle. It is also a tool for health care provider to involve patient in decision-making and transitioning of care from physician alone to patient and physician. Diabetes educators should therefore need to know the importance of SMBG and how to use it effectively to help patients achieve the desired goals and improve outcomes.

## SMBG and structured SMBG (sSMBG):

Self-monitoring of blood sugar or SMBG is capillary glucose monitoring of the patient done by a relative or health care worker at home or hospital settings. It is directed by the physician

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with the intent of understanding patterns of blood sugar and thus adjusting drug and lifestyle therapy. sSMBG refers to the monitoring of blood sugars in a particular pattern as defined or agreed before between physician and the patient. Blood sugars are monitored at specific timings to make a logical sense of dynamic changes in blood sugars. This enables the patients and clinicians to understand the blood glucose pattern throughout the day so that appropriate therapeutic adjustments can be made. It also involves maintaining a diet and activity log along with sugar monitoring for understanding the impact of lifestyle on blood sugars. sSMBG also involves imparting proper education and motivating the patients, diabetes educators, apart from explaining the technique of how to conduct the SMBG, should emphasise the fact that this helps physician to adjust the medications. An educator should also explain the patients the importance of good glycemic control to patients. The physician's role is to review the SMBG data at every follow-up visit and to discuss the SMBG readings with the patient. Patients can be advised to make minor adjustments of insulin dosage and to incorporate appropriate lifestyle changes based on SMBG readings.

The patient and clinician must agree on the target levels of blood glucose and also on the timing and frequency of testing. Diabetes educators have a role in teaching the method of structured SMBG and taking proper feedback on available data from the patients besides explaining the patients besides explaining the cause of low or high blood sugars to patients. They should direct them to physician for making necessary adjustments and further motivate them to continue regular monitoring.

Benefits of structured over unstructured SMBG are well-documented in literature. Also, evidence suggests that lack of knowledge about how to interpret the results of SMBG and how to adjust the dose based on those results is the main deterrent in the success of SMBG. This further emphasizes the importance of sSMBG. It has been demonstrated that SMBG is of limited value when it is not applied in a structured fashion.

#### **Structured SMBG - guidelines and recommendations:**

Till date, many guidelines have been published which propagate a similar frequency of SMBG measurement requirement on daily basis in Type 1 and Type 2 DM with or without insulin therapy.

**The frequency of the SMBG in Type 1 and Type 2 DM patients on OAD or on OAD and insulin therapy is given in table below:**

Type 1 DM		Type 2 DM on OADs		Type 2 DM on insulin or insulin +OADs	
Adults	Children	New onset DM/ uncontrolled DM/ DM during acute illness	Stable/well- controlled DM	New onset DM/ uncontrolled DM/ DM during acute illness	Stable/well-controlled DM
<ul style="list-style-type: none"> <li>2 to 8 times/day</li> </ul>	<ul style="list-style-type: none"> <li>At least 4 times/day and should include pre-prandial and bedtime levels</li> </ul>	Patients on SU or meglitinides <ul style="list-style-type: none"> <li>At least 4 times/day and should include pre-prandial and bedtime levels</li> </ul> Patients on other OADs <ul style="list-style-type: none"> <li>At least FBG on alternate days</li> </ul>	<ul style="list-style-type: none"> <li>At least 4 tests in a week on 4 consecutive days or on alternate days (including FBG and 3 post-prandial values)</li> </ul>	<ul style="list-style-type: none"> <li>At least 4 times/day and should include pre-prandial and bedtime levels</li> <li>Must check whenever hypoglycemia is suspected</li> </ul>	<ul style="list-style-type: none"> <li>Paired testing at least 3–4 days in a week (1 day/week pre and post breakfast, 1 day/week pre and post lunch and 1 day/week pre and post dinner) or as frequently as possible.</li> <li>Must check whenever hypoglycemia is suspected</li> </ul>

Source: RSSDI Guidelines, 2018.

**SMBG and Hypoglycemia:**

sSMBG is an important tool which can detect hypoglycemia.

1. It can make the physician and patient aware about hypoglycaemic unawareness which can help revise targets and personalise the therapy.
2. It can detect the Somogyi effect and help to make changes in insulin or oral therapy accordingly.
3. It can also help to understand whether any activity or adjuvant therapy may be responsible for hypoglycemia.
4. It can help reduce hypoglycemic-related fears and reduce hospitalisations by identifying hypoglycemia in time and allow timely correction of the same.

**SMBG and Behavioural changes:**

Diabetes self-management includes monitoring as one of the very essential behaviours in self-management and daily SMBG has been identified, with due available evidence as an effective tool which provides immediate feedback about the effects of food, physical activity, stress and medications.

Patients who change their behaviour in response to SMBG readings can bring about a change in HbA1C and live a good quality of life.

Contrary to earlier belief, that SMBG can cause anxiety and stress, structured SMBG, if rightly applied to a knowledgeable patient can lead to reduction in their anxiety and improve quality of life. It also gives an insight into patient preferences, activity-levels and medication prescribed.

Therefore, the SMBG education program should go beyond the basics of how to perform SMBG and should include knowledge and applications regarding appropriate self-care behaviour. It should also include motivational strategies which can help patients to take control of their own diabetes management. The components of SMBG education program should include: -

- 1) Instructions on how to use a glucose meter.
- 2) How to read and interpret the results.
- 3) To understand the targets which are specific and may change with the situations.
- 4) Teaching problem-solving and how to change the behaviour as per the blood sugar pattern.
- 5) To devise action plan for achieving the targets agreed.
- 6) Provide an explanation that a particular feeling or symptom may not always indicate that blood glucose is high or low, so to avoid taking sugars before documentation of the same.
- 7) To create a regimen favouring patient's lifestyle and has an ease of integration.
- 8) Non-judgmental evaluation of SMBG results.

**Conclusion:**

The sSMBG is a very important tool to help change the patient's behaviour and also impact the HbA1C and glucose control outcomes. sSMBG is to be incorporated as a part of diabetes self-management and education. Patient should be willing and motivated to do SMBG and their concerns have to be addressed by both the physician and diabetes educator. The diabetes educator plays a pivotal role in keeping up the motivation of the patient and sensitising the patient about the role of SMBG, thus empowering them to better manage their diabetes optimally.

**References for further reading:**

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## QUESTION & ANSWERS

### **Q. Are diabetics more prone to develop COVID-19?**

The jury is still not out on this question. However, it is clear that diabetics who develop COVID-19 are more likely to suffer from complications such as cardiac, respiratory and requirement of mechanical-ventilation and death. The reasons for this are manifold. It is known that diabetics have a lower innate immunity which makes them more vulnerable to infections. This is especially true if their blood sugars are uncontrolled (i.e.  $>200$  mg/dL). Secondly, diabetics are also liable to have other associated conditions like hypertension, cardiac disease and chronic kidney disease which in turn increase the risk of their developing complications or dying. Thirdly, they are more prone to develop a cytokine storm, a hyper inflammatory response in the lungs, which is responsible for requirement of mechanical ventilation and often death. To summarise, diabetics should practice prevention measures with respect to COVID-19 and keep their blood sugars well controlled in order to avoid poor outcomes.

### **Q. What precautions should be taken by a diabetic during the COVID-19 pandemic?**

A diabetic should take all the usual precautions that a non-diabetic takes during the COVID-19 pandemic. This includes physical distancing e.g. not going out to crowded areas or poorly ventilated spaces, wearing a mask and maintain hand hygiene. In addition to these usual precautions, a diabetic should follow a balanced diet, an exercise plan and monitor his/her blood sugars frequently. Most oral medications can be continued, hence he or she should take them regularly. He or she should

stay in touch with their medical practitioner and maintain a positive attitude. Mental health is as important as physical health and it can suffer during the COVID-19 pandemic. Keeping oneself busy with reading and working from home is desirable. If one were to develop mild COVID-19, the same principles apply. Frequent monitoring, checking for high or low blood glucose using a glucometer as well as checking urine for ketones when blood sugars are high. Those on insulin must follow a good sick-day routine when unwell.

### **Q. What diabetic medications can be taken by a diabetic safely during the COVID-19 pandemic?**

Most oral agents can be taken safely by a non-infected person or by a person with mild COVID infection. However, there are a few notable exceptions. Metformin and DPP inhibitors are safe and in fact DPP-4i may play a protective role in preventing this infection. Sulfonylureas can be used with caution, remembering that hypoglycemia is a risk with this class of medications. Pioglitazone can cause fluid retention and hence is to be avoided. SGLT-2 inhibitors are also to be avoided as they are associated with fluid depletion (or dehydration) and rarely diabetic ketoacidosis. In more unwell patients requiring hospitalization or ICU admission, insulin is the drug of choice. Some drugs like corticosteroids are very successful in reducing morbidity and mortality but can raise blood sugars acutely. Thus, in the hospital setting in such a scenario, insulin through an infusion pump offers maximum flexibility and efficacy.

**MK**

# MYTHS AND FACTS

## 1. Myth: “No fat” or “low fat” label indicates you can eat all you want and not gain weight.

**Fact:** Many low fat or no fat food products have added sugar, salt or starch to make up for the reduction in fat. These foods often contain just as many calories as the regular version. Always check the nutrition label to see how many calories are there per serving. Before eating a fat-free food, make sure the product is not loaded with sugar or additives, and that it is indeed lower in calories than the regular version. Also check the serving size. For example, if you eat three servings of a low-fat ice cream, at 3 grams of fat and 250 calories per serving, you are eating 9 grams of fat and 750 calories!

## 2. Myth: Microwaving is bad for food and is dangerous.

**Fact:** Cooking methods affect the food you are eating. Whether you are using a microwave, a charcoal grill, a fryer, or a solar-heated stove, the heat and the amount of time you are cooking, affects the food. The longer and hotter you cook a fish, the more you will lose certain heat and water-sensitive nutrients, especially vitamin C and thiamin (B vitamin). In fact, because microwave cooking often cooks foods more quickly, it can actually help to minimise nutrient losses.

Microwave ovens are devices in which energy travels in waves of energy that spread out as they go and heat up the food from within. Microwaves, much like radio waves and energy waves, are very low intensity forms of radiation (unlike X-rays and gamma rays, which do pose health concerns). Be aware, however, that some plastic containers that we use to microwave our food are not meant for microwaving and may

lead to plastic compounds being passed into your food. This is why you should only use microwave-safe containers.

## 3. Myth: Brown sugar is healthier than white sugar.

**Fact:** There is virtually no nutritional difference between brown and white sugar. In fact, brown sugar is actually white granulated sugar with added molasses. Brown sugar does contain extremely small amounts of minerals, but unless you eat a gigantic portion of brown sugar every day, the mineral content difference between brown sugar and white sugar is absolutely insignificant.

Remember, that the idea that brown sugar is a healthier option than white sugar is mostly due to clever marketing. Many foods (fruits, honey, and milk) already contain other types of sugars that are processed and used by your body. Be particularly careful with your sugar intake (portion size matters, not the quality of sugar) if there is a history of diabetes in your family.

## 4. Myth: Super foods are super healthy.

**Fact:** Goji berries, kale, chia seeds, and quinoa: the list of “superfoods” grows every year. Just as there is no super pill to make you healthy, there is not one food that can make you lose weight or cure cancer. Superfoods are simply trendy. There is no clear definition of what constitutes a superfood. While these foods may benefit us due to their nutrient density, so are apples and carrots. Superfoods are often portrayed in the media to suggest that you should consume them exclusively to achieve good health and wellbeing. One would want to keep moderation and inclusion of a variety of food to achieve health benefits.

### 5. Myth: A detox diet is needed to clear toxins.

**Fact:** There has been a recent obsession with “detox” diets, as if our bodies are not equipped to get rid of “toxins”. Toxicity is the degree to which a substance can damage an organism. An abundance of numerous substances can eventually cause toxicity, which is why moderation is so important. There are substances that can cause acute or chronic toxicity in high amounts and it is best to avoid those. Detox diets make big promises but do not deliver the science to back up their claims. It is true that a couple of days free from processed foods and high in fibrous foods such as vegetables and fruits, do the digestive system some good and in turn make you feel better. Our body is quite spectacular: our liver, kidneys, intestines, and lungs eliminate unwanted waste. Our insides are not dirty and do not need to be cleansed with juices, pills

or potions. Infact, some detox diets include intestine-clearing supplements that might actually be quite harmful. Some juices used in “detoxes” and “cleanses” that have not been pasteurized or treated in other ways to kill harmful bacteria can make people sick. The illnesses can be serious in children, elderly people and those with weakened immune systems. Some juices are made from foods that are high in oxalate, a naturally occurring substance. For example: spinach and beet juice. Drinking large quantities of high-oxalate juice can increase the risk for kidney problems. “Detoxification” programs may include laxatives, which can cause severe diarrhoea leading to dehydration and electrolyte imbalances. Also, drinking large quantities of water and herbal tea and not eating any food for days in a row could lead to dangerous electrolyte imbalance and in those with a compromised heart or kidney function, a sudden fluid overload.

**JJ**

# RECIPES

## MILLET SOYABEAN CUTLET



### Ingredients

- Rava 15 gm
- Sama 15 gm
- Ragi 15 gm
- Soya chunks 30 gm
- Green chilli 2 no.
- Coriander leaves and mint leaves a few
- Salt to taste
- Oil 1 tsp

### Method:

- Soak soya chunks into hot water for 30 minutes.
- Drain out the water and in a large bowl, squeeze off excess water.
- Put soya chunks into a blender. Add green chili, mint leaves, coriander leaves and blenderise everything into a coarse paste.
- Add the rava, sama and ragi flour and salt to the soya chunks paste. Mix and make a

smooth dough.

- Shape these in the form of round cutlets also known as tikki.
- In a pan, heat oil mildly and place the cutlets. Cook them over medium heat.
- Once golden brown on one side, flip them over and cook till crispy on the other side as well.
- Serve this with yogurt.

### Provides 2 servings

### Nutritional information per serving:

Energy (kcal)	Carbohydrates (gm)	Protein (gm)	Fats (gm)	GI
276.8	37	19.1	5.7	Medium

### Special features:

- A healthy snack.
- A high protein recipe.

JJ

## BUCKWHEAT MILLET THALIPEETH



### Ingredients

• Buckwheat	15 gm
• Jowar	15 gm
• Bajra	15 gm
• Besan	30 gm
• Ajwain	5 gm
• Cumin powder	1 tsp
• Sesame seed	5 gm
• Ginger	1 tsp
• Green chilli	1 no
• Oil	1 tsp
• Salt	to taste

### Method:

1. Mix all above ingredients in a large bowl.
2. Add water in parts and knead into a soft dough.
3. Make medium size balls of the dough.
4. Grease the tawa with little oil.

5. Place the ball on the oiled surface and with slightly moist hand, flatten the dough into a round shape.
6. Make a hole in the center.
7. Heat the tawa. Brush some oil in the center and at the corners. Cover and cook till both sides are golden. Generally takes between 7 to 10 min.
8. Serve the cooked thalipeeth with green chutney or yogurt.

### Provides 2 servings

### Nutritional information per serving:

Energy (kcal)	Carbohydrates (gm)	Protein (gm)	Fats (gm)	GI
364.05	52.5	13.2	12.3	Medium

### Special features:

- A healthy recipe for lunch.
- A high fiber and high protein recipe.

**JJ**



# HOW KNOWLEDGEABLE ARE YOU?

1. The following symptom does not suggest neuropathic pain in diabetes:
  - a. Pain predominantly at night worsened by contact with bedsheets
  - b. Burning sensations in the feet punctuated by sharp electric-shock pains
  - c. Continuous pain or discomfort not relieved by traditional analgesics
  - d. Low backache, radiating down the buttocks and legs, aggravated on walking
2. In Type 2 diabetes, heart failure should be suspected when:
  - a. Patient has edema of face in the morning
  - b. When pulse rate is fast
  - c. When there is shortness of breath on walking and edema feet
  - d. When there is chest pain on exertion
3. Hypertension and diabetes:
  - a. Is more common in Type 2, than in Type 1 diabetes
  - b. It is intermittent in nature
  - c. It is reversible
  - d. When treated, there is a postural rise on standing
4. Insulin deficiency is associated with:
  - a. Increased triglycerides
  - b. Increased LDL-cholesterol
  - c. Increased HDL-cholesterol
  - d. Increased total cholesterol
5. The following is a recognized risk factor for stroke in diabetes:
  - a. Atrial fibrillation
  - b. Very high blood sugar
  - c. Recurrent hypoglycaemia
  - d. Both B and C
6. The following are typical features of diabetic diarrhoea:
  - a. Abdominal pain and cramps
  - b. Often associated with faecal incontinence
  - c. May alternate with periods of constipation
  - d. Both B and C
7. Oral phosphodiesterase Type 5 (PDE-5) inhibitors should be avoided in patients taking:
  - a. An angiotensin II receptor blocker
  - b. A potassium channel activator
  - c. A  $\beta$  blocker
  - d. Isosorbide

8. A sudden painful swelling of a great toe joint on arising in the morning is due to:
  - a. Gout
  - b. Septic arthritis
  - c. Fungal infection
  - d. Acute Charcot disease
9. Which is the drug of choice in a Type 2 diabetic with BMI of 40 kg/m<sup>2</sup> with atherosclerotic cardiovascular disease and normal renal function?
  - a. DPP-4 inhibitors
  - b. Metformin
  - c. GLP-1 Agonist
  - d. SGLT2 inhibitor
10. Which oral antidiabetic can be safely continued in sick, hospitalised patients with kidney failure and eGFR <30 ml /min/1.73 m<sup>2</sup>?
  - a. DPP-4 inhibitors
  - b. SGLT-2 inhibitors
  - c. Glimepiride
  - d. Metformin

JJ

ANSWERS:

- |   |      |   |     |   |     |
|---|------|---|-----|---|-----|
| a | (10) | a | (8) | d | (7) |
| c | (6)  | a | (5) | a | (4) |
| d | (9)  | c | (2) | d | (1) |
| a | (3)  |   |     |   |     |



# **CERTIFIED DIABETES EDUCATOR COURSE**

## **HELP DEFEAT DIABETES TRUST Announces**

### **Reward of Rs. 10,000/- for securing highest marks**



**Nature of Course:** Virtual

**Duration:** 6 months

**Course Highlights:**

- Get certificate of training in diabetes
- Get practical exposure under a recognized mentor in your own town
- Get access to 800 pages of study material and more than 18 audio & audiovisuals.

**Criteria for award:**

- To complete the course in given time frame i.e. 6 months.
- To secure highest marks in the current year.

For further details visit [helpdefeatdiabetes.org](http://helpdefeatdiabetes.org)

# CERTIFIED DIABETES EDUCATOR COURSE

*Dr Chandalia's DENMARC in association with Help Defeat Diabetes Trust (HDDT) presents to you a course to be a Certified Diabetes Educator (CDE)!*

Help Defeat Diabetes Trust (HDDT) is a registered, non-profit public trust, having amongst its many objectives, the main objective of promoting education and awareness about diabetes among people from different fields.

## **Who can enroll?**

Graduates in Nutrition, Nursing, Pharmacy, Occupational and Physiotherapy.

## **What is the duration of the course?**

6 months, including 3 months (300 Hours) of hands-on training and experience with a recognized mentor in your own town (see this on our website).

## **How can I do this course from my place of residence?**

The Mentor can be selected from the particular locality and under whom the training can be done.

## **How will I get the course material?**

All course material is available online on our website.

## **What are the course fees?**

The standard fees for the course are INR 10,000/- only.

## **Where can I get more information about this course?**

Kindly visit our website <http://www.helpdefeatdiabetes.org> or you can get in touch with us on our email ID [heldefeatdiabetesinfo@gmail.com](mailto:heldefeatdiabetesinfo@gmail.com).

# MEMBERSHIP FORM

## Association of Diabetes Educators (ADE)

(For eligibility criteria: Check Website [www.diabeteseducatorsindia.com](http://www.diabeteseducatorsindia.com))



Name .....

Address .....

..... Date of Birth: .....

Telephone: Res: ..... Office: ..... Cell: .....

E-mail id: .....

Educational Qualifications:.....

.....

.....

Work Experience: .....

.....

.....

Currently employed at: .....

.....

Certificates attached regarding educational qualification and work experience:

.....

₹ 2000/- is payable in cash / cheque / draft with the application form

Add ₹ 100/- for outstation cheques

**Cheque Drawn in favour of:** Association of Diabetes Educators

**Payment Details:** Cheque No./Draft No. \_\_\_\_\_ Dated \_\_\_\_\_

Bank \_\_\_\_\_ Branch \_\_\_\_\_

.....  
Signature

(E-form is available on website [www.diabeteseducatorsindia.com](http://www.diabeteseducatorsindia.com))



## **CHALLENGES IN DIABETES EDUCATION**

**AN AWARD FOR PROBLEM RESOLUTION IN DIABETES EDUCATION**

**SPONSORED BY DR. CHANDALIA'S HELP DEFEAT DIABETES  
TRUST**



**Prize money of Rs. 10,000 for reporting a problem case**

Dr. Chandalia's HDDT aims to enhance the quality of Diabetes education in India by creating a world-class research and education environment and to build up a platform of networking and knowledge sharing within diabetologists and/or diabetes educators.

Challenges in Diabetes Education 2021 places special emphasis on supporting educational initiatives that have the potential to improve and significantly revolutionize diabetes care, enhance self-management and/or support patients with Type 1 or Type 2 Diabetes Mellitus. The educator should describe an individual or group case history and identify the problem in diabetes education. Furthermore, s/he should describe the plan of education to resolve the issue, partly or totally. The issue described may be related to patient perceptions, knowledge, behaviors and implementation of advice given. S/He should describe her struggle in resolving the issue including her triumphs and failures, the methodologies used and ethical, socio-economic and behavioral aspects of the case.

General Rules and Regulations regarding the eligibility Criteria for the Award

- The applicant of the Award should be a citizen of India and member of Association of Diabetes Educators.
- The case discussion should be on the subject of Diabetes Education.

The best case chosen by a group of referees will be awarded "Challenges in Diabetes Education Award- 2021" - which will carry a cash prize of Rs 10,000. The awardee will get the opportunity to present the case in the annual meeting of Association of Diabetes Educators and publish it in the journal of Diabetes Education.

**The last date for the submission is 30th December, 2021 !!!!**

(Instructions for authors is available on website [www.diabeteseducatorsindia.com](http://www.diabeteseducatorsindia.com))

# REDEFINING CONTROL<sup>^</sup> FOR AN OPTIMIZED INSULIN EXPERIENCE

Introducing








## Toujeo™

insulin glargine 300U/mL

The Next Generation Insulin Glargine



-  **More stable and prolonged** activity profile, with less glycemic variability<sup>2</sup>
-  Predictable and sustained HbA1c control from a once daily injection<sup>4</sup>
-  Toujeo™ addresses the worry of insulin-related body weight gain<sup>1</sup>
-  **Lower risk of hypoglycaemia\*** including during the titration phase, in people with T2DM<sup>1</sup>
-  The advantage of **dosing flexibility** ( $\pm 3$  hours) when needed<sup>2,3</sup>

\* Confirmed  $\geq 3.9$  mmol/L (70 mg/dL) or severe hypoglycaemic events (24 hours). <sup>^</sup> Better glycaemic control and less hypoglycaemia with insulin glargine 300 U/mL vs glargine 100 U/mL. Ritzel R et al. Diabetes Obes Metab. 2017 Sep 1. (Epub ahead of print). 1. Boll GB, et al. Diabetes Obes and Metab. 2015;17(4):386-394. 2. Becker RH, et al. Diabetes Care. 2015;38:637-643. 3. Toujeo™ prescribing Information 4. Strong J et al. Curr Med Res Opin. 2017 Apr;33(4):785-793

#### INSULIN GLARGINE INJECTION

##### TOUJEO™ SoloStar™ Abridged Prescribing Information

**COMPOSITION:** Insulin glargine 300 U/mL. 1 mL contains 10.91 mg insulin glargine I.P., corresponding to 300 U of insulin glargine. **INDICATION:** For the treatment of diabetes mellitus in adults. **DOSAGE AND ADMINISTRATION:** Toujeo™ is given subcutaneously. Toujeo™ is administered once daily, at any time during the day, preferably at the same time every day. The recommended daily starting dose is 0.2 U/kg once daily followed by individual dosage adjustments. When needed, patients can administer their injections up to 3 hours before or after their usual time of administration. The desired blood glucose levels as well as the doses and timing of anti-hyperglycaemic medications must be determined and adjusted individually. Toujeo™ is not the insulin of choice for the treatment of diabetic ketoacidosis. Changing from once-daily basal insulin products to once-daily Toujeo™ can be done unit-to-unit based on the previous basal insulin dose. Changing from twice-daily basal insulin products to once-daily Toujeo™, the recommended initial Toujeo™ dose is 80% of the total daily dose of the basal insulin that is being discontinued. Toujeo™ must not be mixed with any other insulin products. Toujeo™ must not be diluted. The safety and effectiveness of Toujeo™ has not been established in paediatric patients (under 18 years of age). Toujeo™ can be used in elderly patients, in patients with renal impairment and in patients with hepatic impairment. Close glucose monitoring is recommended. **SAFETY-RELATED INFORMATION Contraindications:** Toujeo™ must not be used in patients hypersensitive to insulin glargine or any of the excipients. **Warnings:** No Core Safety Information **Precautions: General:** Insulin treatment generally requires appropriate diabetes self-management skills including glucose monitoring, proper injection technique and hypo and hyperglycaemia management. Patients and their relatives must know what steps to take if hyperglycaemia or hypoglycaemia occurs or is suspected, and they must know when to inform a physician. Hypoglycaemia: The time of occurrence of hypoglycaemia depends on the action profile of the insulins used and may, therefore, change when the treatment regimen is changed. As with all insulins, particular caution should be exercised, and intensified blood glucose monitoring is advisable, in patients in whom sequelae of hypoglycaemic episodes might be of particular clinical relevance. The prolonged effect of subcutaneous Toujeo™ may delay recovery from hypoglycaemia. In patients with renal impairment or severe hepatic impairment, insulin requirements may be diminished. In the elderly, progressive deterioration of renal function may lead to a steady decrease in insulin requirements. Hypoglycaemia can generally be corrected by immediate carbohydrate intake. So that initial corrective action can be taken immediately, patients must carry a minimum of 20 grams of carbohydrates with them at all times. Intercurrent illness: Requires intensified metabolic monitoring. In many cases urine tests for ketones are indicated, and often it is necessary to adjust the insulin dose. **Medication errors prevention:** Insulin label must always be checked before each injection to avoid medication errors between Toujeo™ and other insulins. The patients must also be instructed to never use a syringe to remove Toujeo™ from the SoloStar pre-filled pen into a syringe and not to re-use the needles. **Pregnancy & Lactation:** It is essential for patients with pre-existing or gestational diabetes to maintain good metabolic control throughout pregnancy to prevent adverse outcomes associated with hyperglycaemia. Toujeo can be used during pregnancy, if clinically needed. Insulin requirements may decrease during the first trimester and generally increase during the second and third trimesters. Immediately after delivery, insulin requirements decline rapidly. Careful monitoring of glucose control, is essential in such patients. Patients with diabetes must inform their doctor if they are pregnant or are contemplating pregnancy. **Adverse Reactions:** Hypoglycaemia is most frequent and may occur if the insulin dose is too high in relation to the insulin requirement. A marked change in glycaemic control may cause temporary visual impairment. Lipodystrophy may occur at the injection site. Allergic reactions at the injection site includes redness, pain, itching, hives, swelling or inflammation. Immediate type allergic reactions are rare

For full prescribing information please write to Sanofi India Ltd., Sanofi House, CT Survey No 117-B, L&T Business Park, Saki Vihar Road, Powai, Mumbai 400072

**Dated:** June 2017 **Source:** CCDS Version 1.1 dated June 2016

For the use of a registered medical practitioner or a hospital or a laboratory only.

SAN GLA17121565\_04/18



# RYZODEG™

## The no compromise insulin



**Significantly  
superior start<sup>1</sup>**



**Preferred choice for  
intensification<sup>2</sup>**



**Convenience  
of a single pen<sup>1</sup>**



**Abbreviated Prescribing Information:** Insulin degludec/insulin aspart **Ryzodeg™ FlexTouch®**: Consult Pack Insert before prescribing. Ryzodeg™ (insulin degludec/insulin aspart) 100 units/mL insulin solution for subcutaneous injection in a pre-filled pen (FlexTouch®). **Presentation:** Ryzodeg™ FlexTouch®, 1 mL solution contains 100 units insulin degludec/insulin aspart in the ratio 70/30 (equivalent to 2.56 mg insulin degludec and 1.05 mg insulin aspart). One pre-filled device contains 300 units of Ryzodeg™ in 3 mL solution. **Indications:** Treatment of diabetes mellitus in adults. **Posology and administration:** Ryzodeg™ can be administered once- or twice-daily with the main meal(s). In patients with type 2 diabetes mellitus, Ryzodeg™ can be administered alone, in combination with oral anti-diabetic medicinal products, and in combination with bolus insulin. In type 1 diabetes mellitus, Ryzodeg™ is combined with short-/rapid-acting insulin at the remaining meals. Administration by subcutaneous injection only. Ryzodeg™ should be dosed in accordance with individual patient needs. Dose adjustments are recommended to be primarily based on FPG measurements. Ryzodeg™ allows for flexibility in the timing of insulin administration as long as it is dosed with the main meal(s). In older patients and patients with renal and/or hepatic impairment, glucose-monitoring should be intensified and the insulin dose adjusted on an individual basis. The safety and efficacy of Ryzodeg™ in children and adolescents below 18 years of age have not been established. Ryzodeg™ comes in a pre-filled pen (FlexTouch®) designed to be used with NovoFine® injection needles. The pre-filled pen delivers 1–80 units in steps of 1 unit. **Contraindications:** Hypersensitivity to the active substances or any of the excipients. **Special warnings and precautions:** Too high insulin dose, omission of a meal or unplanned strenuous physical exercise may lead to hypoglycaemia. Inadequate dosing and/or discontinuation of treatment in patients requiring insulin may lead to hyperglycaemia and potentially to diabetic ketoacidosis. Concomitant illness, especially infections, may lead to hyperglycaemia and thereby cause an increased insulin requirement. When using insulin in combination with pioglitazone, patients should be observed for signs and symptoms of heart failure, weight gain and oedema. Pioglitazone should be discontinued if any deterioration in cardiac symptoms occurs. Hypoglycaemia may constitute a risk when driving or operating machinery. **Pregnancy and lactation:** There is no clinical experience with use of Ryzodeg™ in pregnant women or in those who are breastfeeding. Undesirable effects: Refer to pack insert for complete information on side effects. Very common ( $\geq 1/10$ ); common ( $\geq 1/100$  to  $< 1/10$ ); uncommon ( $\geq 1/1,000$  to  $< 1/100$ ); rare ( $\geq 1/10,000$  to  $< 1/1,000$ ); very rare ( $< 1/10,000$ ), not known (cannot be estimated from the available data). Very common: Hypoglycaemia. Common: Injection site reactions. Not known: Lipodystrophy. Uncommon: Peripheral oedema and rare: Hypersensitivity and urticaria. With insulin preparations, allergic reactions may occur; immediate-type allergic reactions may potentially be life threatening. Injection site reactions are usually mild, transitory and normally disappear during continued treatment. **Manufactured by:** Novo Nordisk A/S, Novo Alle, DK-2880 Bagsvaerd, Denmark. **Imported by:** Novo Nordisk India Private Limited, Plot No. 32, 47 - 50, EPIP Area, Whitefield, Bangalore - 560066. For the use only of registered medical practitioner or a hospital or a laboratory. Ryzodeg™, FlexTouch™ and NovoFine® are trademarks owned by Novo Nordisk A/S, Denmark. Please refer latest pack insert for more details.

**References:** 1. Onishi Y, Ono Y, Rabol R, Endahl L, Nakamura S. Superior glycaemic control with once-daily insulin degludec/insulin aspart versus insulin glargine in Japanese adults with type 2 diabetes inadequately controlled with oral drugs: a randomized, controlled phase 3 trial. *Diabetes Obes Metab*. 2013;15(9):826–832. 2. Rodbard HW, Cariou B, Pieber TR, et al. Treatment intensification with an insulin degludec (IDeg)/insulin aspart (IAsp) co-formulation twice daily compared with basal IDeg and prandial IAsp in type 2 diabetes: a randomized, controlled phase III trial. *Diabetes Obes Metab* 2016;18:274–80.



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