RSSDI
Indian Diabetes
EDUCATOR JOURNAL

Theme of the Month

Diabetes and Surgical Considerations

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

2015 2016 2017 2018 2019 2020 2021 2022 2023 2024

Longest Running Monthly Journal

In collaboration with USV

RSSDI Indian Diabetes
EDUCATOR JOURNAL

1 st time in India
To keep the members of diabetes care team abreast with DSME and DSMS concepts

EDITORIAL BOARD

Scan the QR code to access full library of IDEJ - **https://usvmed.com/**

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

NATIONAL ADVISORY BOARD

RSSDI Indian Diabetes EDUCATOR JOURNAL

1 st time in India
To keep the members of diabetes care team abreast with DSME and DSMS concepts

FOREWORD

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

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

Effective management of diabetes during the perioperative period is crucial due to the growing prevalence of diabetes mellitus and the subsequent increase in surgical procedures among people living with diabetes. Ensuring optimal blood glucose control before, during, and after surgery is essential for preventing complications. This issue of IDEJ highlights various considerations in diabetes management with respect to different surgeries.

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

Sincere Regards,

Dr. Sanjay Agarwal
RSSDI Secretary

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

Expert Contributors
of the month

Dr. Prakash Rai

MBBS, MD (Medicine)
Consultant Physician, Clinical Cardiologist and Diabetologist, Mumbai

Article: Perioperative Management in Diabetes

Dr. Ankur Raval

MD (General Medicine)
Consultant Physician and Diabetologist, Dr. Ankur Raval Hospital, Anand

Article: Development of Diabetic Foot Ulcer and its Management

Dr. Aushili Mahule

BDS, MDS, PGDCR
Medical Advisor, USV Pvt. Ltd., Mumbai

Article: Care Around Dental Surgery in People with Diabetes

Dr. Paresh Gohel

MD (Internal Medicine)
Consultant Physician, Aarna Medical Hospital, Ahmedabad

Article: Amputation Risk in Individuals with Diabetes

Dr. Anurag Nema

MS (General Surgery), FMAS, DMAS
Consultant General and Laparoscopic Bariatric Surgeon, Icon Hospital, Surat

Article: Interview with Dr. Anurag Nema

Dr. Mukesh Gupta

MBBS, MD (Obstetrics and Gynecology), DNB (Obstetrics and Gynecology), PGD in Psychological Counselling
Consultant Obstetrician and Gynecologist, Founder of Le'Nest, Dr. Gupta Nursing Home, Mumbai

Article: Association of C-section Delivery to Risk of Diabetes

Expert Contributors
of the month

Dr. Shashank Shah

MBBS, MS, FAIS, FMAS (Hon.), FIAGES (Hon.), FALS (Hon.)

Consultant General and Laparoscopic Bariatric Surgeon,
Co-founder and Director of Laparo Obeso Centre,
Pune and Mumbai

Article: Bariatric Surgery and its Effectiveness in Diabetes Management

Dr. Dhrumil Patel

MBBS, MD, FID (UK)

Consultant Diabetologist and Thyroid Specialist,
Dr. Dhrumil's Diabetes and Thyroid Speciality Clinic, Ahmedabad

Article: Pancreatic Islet Transplantation in Type 1 Diabetes

Dr. Vitrag Shah

MBBS, C. Diab.

Consultant Diabetologist, Achintya Wellness, Surat

Article: Prognosis of Coronary Artery Bypass Graft (CABG) Surgery in Diabetes

Dr. Savitri Gorakh

MBBS, D. Diab., F. Diab., D. Nutrition

Consultant Diabetologist and Family Physician,
Dr. Gorakh's We Care Clinic, Mumbai

Article: Frequently Asked Questions on Diabetes and Surgical Considerations

To get featured in the Indian Diabetes Educator Journal you can connect with us on the below mail ID for further communication: info@nurturehealthsolutions.com

RSSDI Indian Diabetes
EDUCATOR JOURNAL

Issue No. 115, October 2024

Table of Content

Cover Story: Perioperative Management in Diabetes

Dr. Prakash Rai

MBBS, MD (Medicine)

Consultant Physician, Clinical Cardiologist and Diabetologist, Mumbai

Perioperative management involves care before, during, and after surgery to enhance outcomes, reduce complications, and ensure recovery. For people with diabetes (PWD), controlling blood glucose is crucial, as hyperglycemia increases surgical risks, delays wound healing, and raises infection rates such as postoperative sepsis, intensive care unit (ICU) admissions, hospital stays, and postoperative mortality. Surgical stress and anesthesia raise hormones like cortisol and glucagon, reducing insulin and worsening hyperglycemia. Uncontrolled hyperglycemia causes osmotic diuresis, electrolyte imbalances, and proinflammatory cytokines, leading to mitochondrial injury, endothelial dysfunction, and immune dysregulation.

Various guidelines offer recommendations for optimal glucose management, advising an average blood glucose level of 80 to 180 mg/dL during the perioperative period, with a reasonable goal of maintaining levels between 140 and 180 mg/dL to prevent hypoglycemia and hyperglycemia. For non-critically ill hospitalized patients with terminal illness, limited life expectancy, or high hypoglycemia risk, a slightly higher target of under 200 mg/dL is acceptable.

Preoperative phase

History: Before surgery, it is important to gather a comprehensive medical history of the patient such as the type of diabetes, current management (lifestyle modifications and medications), current glycemic control, presence of complications, susceptibility to hypoglycemia, and any hypoglycemia unawareness.

Surgery: Details should be obtained about any surgery that the patient underwent in the past, including whether it was ambulatory or inpatient, elective, etc. Additionally, information on the fasting instructions for the scheduled surgery should be obtained.

Glycated hemoglobin (HbA1c): A preoperative HbA1c should be checked if not tested in the preceding 3 months. It is recommended to obtain a preoperative HbA1c to assess glycemic control and identify people with undiagnosed diabetes.

Oral anti-hyperglycemic and non-insulin injectable medication: Safety and efficacy concerns arise regarding the use of these in perioperative or hospital settings. For e.g., metformin in particular, may contribute to the development of lactic acidosis in cases of renal dysfunction. Sulfonylureas and other insulin secretagogues pose a risk of hypoglycemia, especially when combined with intravenous infusion, etc. It is recommended to discontinue these medications on the day of surgery, except for sodium-glucose cotransporter 2 (SGLT2) inhibitors, which should be discontinued 24 to 72 hours before surgery. The consulting diabetologist will guide appropriate medication discontinuation or titration, taking individual factors into account.

Insulin therapy: It is recommended to adjust the dosage as follows,

- People on insulin therapy should decrease the dose of long-acting basal insulin by 20–25% the evening before surgery. If taken only in the morning, administer the reduced dose on the morning of surgery. Patients on twice-daily long-acting insulin should reduce the dose by 20–25% both the evening before and the morning of surgery.
- Patients with high doses of basal insulin (>60% of total daily dose [TDD]), a TDD exceeding 80 units, or a high hypoglycemia risk (renal or hepatic insufficiency) should reduce their basal insulin dose by 50–75% to minimize hypoglycemia risk.
- For intermediate-acting insulin (neutral protamine Hagedorn [NPH]), administer the usual dose the evening prior and reduce by 50% on the morning of surgery.
- Patients using premixed insulin should receive long-acting insulin the evening before surgery or reduce the premixed insulin by 50% on the morning of surgery and initiate dextrose-containing IV solutions. Alternatively, skip the morning dose and receive a long-acting formulation in the preoperative area.

During fasting, prandial insulin is withheld, and subcutaneous correctional insulin is initiated with blood glucose monitoring every 4 to 6 hours. Continuous intravenous infusion (CII) with regular insulin is preferred for critically ill patients, especially those with hemodynamic instability, hypothermia, or peripheral vasoconstriction, as it facilitates easy dose titration. Individuals with diabetes should be scheduled for surgery early in the day, with preoperative blood glucose levels checked before surgery. In cases of severe hyperglycemia (>250 mg/dL) or metabolic decompensation (diabetic ketoacidosis or hyperglycemic hyperosmolar syndrome), it may be prudent to postpone surgery until glycemic control improves.

Intraoperative phase

For surgeries under 4 hours with stable hemodynamics, hyperglycemia can be addressed with subcutaneous rapid-acting correctional insulin every 2 hours and regular blood glucose checks. For surgeries over 4 hours, or those with significant hemodynamic fluctuations or fluid shifts, it is advised to use intravenous insulin infusion for blood glucose levels over 180 mg/dL and monitor blood glucose every 1 to 2 hours.

Postoperative phase

In the post-anesthesia care unit (PACU), reviewing intraoperative hyperglycemia management and continuing close glucose monitoring with intravenous or subcutaneous insulin is advised.

- **Ambulatory patients:** Stable patients who can tolerate oral intake can be discharged home on their previous anti-hyperglycemic regimen.
- **Non-critically ill patients:** For those transferred to the ward, subcutaneous insulin can be used. Basal plus correctional insulin is suggested for poor/no oral intake. For regular oral intake, a regimen of basal, bolus, and if needed, correctional insulin is suggested.

Relying solely on correctional insulin is not recommended due to unpredictable glycemic fluctuations. Insulin adjustments should be based on glucose trends, nutritional intake, and clinical status. Effective perioperative diabetes management requires strong interprofessional communication among healthcare providers. A structured, individualized care plan and standardized protocols help reduce errors and improve outcomes. Clear instructions should be given to patients and families about medication changes before and after surgery. Safe transition to outpatient care includes medication reconciliation, patient education, and coordination with outpatient providers. A follow-up visit with the primary care provider is recommended, or sooner if glycemic control is suboptimal.

Resources:

1. Dogra P, Anastasopoulou C, Jialal I. Diabetic Perioperative Management. [Updated 2024 Jan 25]. In: Stat Pearls [Internet]. Treasure Island (FL): *Stat Pearls Publishing*; 2024 Jan. Available from: https://www.ncbi.nlm.nih.gov/books/NBK540965/
2. Kirk, J. K., Gonzales, C. F. Preoperative considerations for patients with diabetes. *Expert Review of Endocrinology & Metabolism.* 2023; 18(6):503–512. https://doi.org/10.1080/17446651.2023.2272865

Development of Diabetic Foot Ulcer and its Management

Dr. Ankur Raval

MD (General Medicine)

Consultant Physician and Diabetologist,
Dr. Ankur Raval Hospital, Anand

Diabetes has various negative metabolic implications, which lead to pathophysiological issues such as diabetic foot ulcers (DFU), neuropathy, and atherosclerosis. DFU is a complex cellulitis or osteomyelitis condition induced by an interaction between the human immune system and invading bacteria that has severe effects on health, economy, and mental state. DFUs develop due to factors like neuropathy, ischemia, nutritional imbalance, and infection. Neuropathy reduces sensation, impairs blood flow, and leads to dry skin and foot deformities. Poor blood flow (ischemia), worsened by peripheral vascular disease, increases susceptibility to ulcers and infections. Infections start with *Staphylococcus* and *Streptococcus* but can become polymicrobial with gram-negative and anaerobic bacteria. People with diabetes face challenges in healing due to a diminished immune response and nutritional deficits.

Management strategies for wound care should include:

1. Maintaining a moist wound environment, preventing infection, offloading the afflicted region, removing necrotic tissue and biofilm, and optimizing perfusion, nutrition, and oxygen delivery. Callus removal, padding, orthotics, therapeutic footwear, walking boots, whole contact casts, and Achilles tendon lengthening are all examples of offloading techniques.
2. Calluses raise the risk of ulcer formation by 11 times, but debriding them lowers pressure exerted by 26%. The combination of Achilles tendon lengthening and total contact casts has been shown to have the best success rate in treating forefoot ulcers.
3. Topical antimicrobials can treat superficial wound infections, but systemic antibiotics are required for cellulitis. Antibiotic treatment typically lasts 2 to 4 weeks. Osteomyelitis may require at least 6 weeks of treatment.
4. Hyperbaric oxygen therapy can prevent amputations for Wagner grade 3 or higher ulcers by increasing oxygen delivery to ischemic/hypoxic tissues, enhancing white blood cell-mediated bacterial killing, angiogenesis, accelerated collagen synthesis, fibroblast growth, and reducing edema.
5. One crucial component of wound care is glucose control. Uncontrolled glucose levels will delay wound healing. Patients who fail to control their blood glucose have poor outcomes, which can eventually result in an amputation.
6. Surgical debridement is crucial for treating diabetic foot infections. The surgery includes debridement of the affected bone. In certain situations, digital amputation may be required. Before performing any debridement, it is important to consult a vascular surgeon, as certain patients may benefit from a bypass of the blocked vessel.

DFUs must be managed in a comprehensive manner that considers the condition's complexities. Maintaining a moist environment, preventing infection, relieving pressure, eliminating necrotic tissue, and improving perfusion and nutrition are all aspects of effective wound care. Topical and systemic antimicrobials, hyperbaric oxygen therapy, and surgical procedures such as debridement are all essential components of treatment. These measures not only promote healing, but also serve to minimize complications and lower the chance of amputation, thereby considerably improving patient outcomes and quality of life.

Key points

- DFU is caused by neuropathy, poor perfusion, and infections, often leading to complex polymicrobial conditions.
- Wound care includes optimal glucose control, maintaining moisture, preventing infection, offloading pressure, and optimizing nutrition and perfusion.
- Superficial infections use topical antimicrobials, while systemic antibiotics are needed for cellulitis and osteomyelitis.
- Hyperbaric oxygen therapy and surgical debridement, including possible amputation, are critical for severe cases.

Resource:

- Murphy-Lavoie HM, Ramsey A, Nguyen M, *et al.* Diabetic Foot Infections. In: StatPearls [Internet]. Treasure Island (FL): *StatPearls Publishing*; 2024 Jan. Updated 2023 Jul 4. Available from: https://www.ncbi.nlm.nih.gov/books/NBK441914/

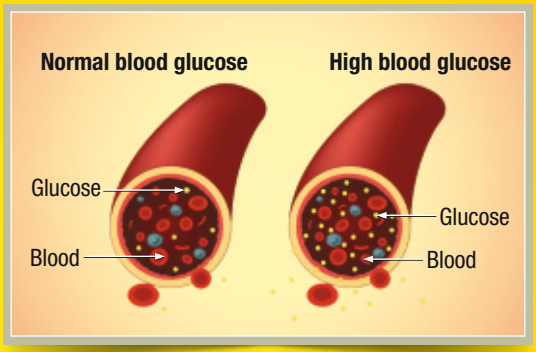
Care Around Dental Surgery in People with Diabetes

Dr. Aushili Mahule

BDS, MDS, PGDCR

Medical Advisor, USV Pvt. Ltd., Mumbai

Dental professionals are likely to come across people with diabetes very frequently, as it is one of the most prevalent conditions. Periodontal disease is a very commonly encountered complication in people with diabetes. The relationship is bidirectional: Hyperglycemia affects oral health, and periodontitis impacts glycemic control. A 2018 systematic review and meta-analysis, updating a 2012 review, confirmed that periodontitis is linked to several diabetes-related complications.



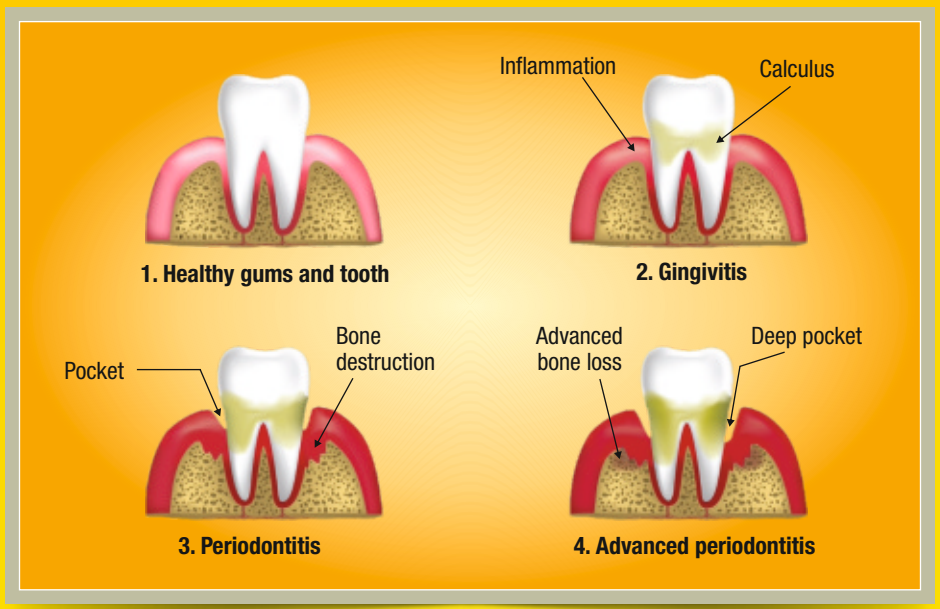
Findings associating periodontitis suggest:

1. Higher hemoglobin A1c (HbA1c) levels in people without and with type 2 diabetes.
2. Worsened complications in people with type 2 diabetes and a higher prevalence of complications in people with type 1 diabetes.
3. Additionally, the study revealed that periodontitis is associated with a higher prevalence of prediabetes and that severe periodontitis significantly increases the risk of developing diabetes.

Diabetes can develop at any age. As with all patients, dentists should assess their medical history, take vital signs, and look for oral signs and symptoms of poorly controlled diabetes, which can be prevalent. Uncontrolled diabetes mellitus (DM) can cause oral manifestations such as xerostomia, burning sensation in the mouth, impaired/delayed wound healing, increased incidence and severity of infections, secondary infection with candidiasis, parotid salivary gland enlargement, gingivitis, and/or periodontitis. Pre-procedure blood glucose monitoring is essential for people with diabetes receiving dental treatment to prevent DM-related complications.

There is mixed evidence suggesting that periodontal treatment procedures, such as scaling and root planing, can improve glycemic control by significantly reducing HbA1c levels at 3 months, with even more reduction after 6 months.

Dental implant placement is generally safe and reliable for people with well-controlled diabetes and possibly for those with moderately controlled diabetes. Recent systematic reviews found that implants in people with diabetes have a high survival rate within the first 3 years if good glycemic control is maintained and that implant procedures are safe for well-controlled people with diabetes. However, these reviews also recommend that clinicians assess HbA1c levels for risk evaluation before and during the implant's lifespan, as hyperglycemia is a significant risk factor for peri-implant inflammation. For people with poorly controlled diabetes, implant placement may have an unpredictable outcome, delayed osseointegration, and a higher risk of failure. Many studies suggest that the use of antibiotic prophylaxis (AP) is a suitable preventive treatment for people with DM due to the increased probability of impaired wound healing and infections after surgical operations in the oral cavity. When treating people with moderately or poorly managed diabetes, elective dental procedures may need to be postponed until glucose levels are stable or well controlled.



Although people with diabetes frequently identify signs and symptoms of hypoglycemia and intervene before experiencing changes in or loss of consciousness, staff should be taught to recognize and manage hypoglycemia. In such circumstances, a glucometer should be used to measure the patient's blood glucose levels, and every dental practice should have guidelines in place for managing hypoglycemia in both conscious and unconscious patients.

Dental healthcare providers are important in screening, early detection, and referrals for these patients. The focus should be on achieving good glycemic control before and after the dental procedure.

Resources:

1. Végh D, Bencze B, Banyai D, *et al.* Preoperative HbA1c and Blood Glucose Measurements in Diabetes Mellitus before Oral Surgery and Implantology Treatments. *Int J Environ Res Public Health.* 2023; 20(6):4745. doi:10.3390/ijerph20064745
2. Sykara M, Maniatakos P, Tentolouris A, Karoussis IK, Tentolouris N. The necessity of administrating antibiotic prophylaxis to patients with diabetes mellitus prior to oral surgical procedures - A systematic review. *Diabetes Metab Syndr.* 2022; 16(10):102621. doi:10.1016/j.dsx.2022.102621
3. Al-Sebaei MO, Bamashmous M, Bassyoni L, Alsubaie R, Alnahdi DO. Pre-Procedure Blood Sugar Levels in Diabetic and High-Risk Patients Visiting King Abdulaziz University Dental Hospital: The Role of the Dentist in Diabetes Screening. *Diabetes Metab Syndr Obes.* 2023; 16:1021-1027. doi:10.2147/DMSO.S405676
4. Wagner J, Spille JH, Wiltfang J, Naujokat H. Systematic review on diabetes mellitus and dental implants: An update. *Int J Implant Dent.* 2022; 8(1):1. doi:10.1186/s40729-021-00399-8
5. Oral health, American Diabetes Association, Available at: https://www.ada.org/resources/ada-library/oral-health-topics/diabetes/

Amputation Risk in Individuals with Diabetes

Dr. Paresh Gohel

MD (Internal Medicine)

Consultant Physician, Aarna Medical Hospital, Ahmedabad

Foot ulcers are one of the primary causes of morbidity among individuals with diabetes, and they are often accompanied by peripheral vascular disease, neuropathy, trauma, or a combination of all three, along with other contributing factors. Amputations of lower limbs are more common in individuals with diabetes, accounting for five out of every six amputations. Individuals having diabetes with foot ulcers have an 8-fold higher risk of a lower extremity amputation than those without diabetes, and almost half of these individuals with diabetes who receive amputations die within 5 years. As a result, early detection of indicators of ulcer progression to a required amputation is critical, and numerous factors should be examined before performing amputation.

A systematic review (2022) which intended to identify the predictors of amputation to enhance the management strategy and care plan recognized these factors as the most critical predictors of amputation: Peripheral arterial disease (PAD), neuropathy, high Wagner's grade, osteomyelitis, postprandial glucose level, white cell count (WCC), C-reactive protein (CRP), erythrocyte sedimentation rate (ESR), low hemoglobin (Hb), and albumin. PAD was found prominent in five studies, making it one of the strongest predictors of amputation. Elevated WCC, ESR, and CRP as markers of infection and inflammation are potent indicators of amputation risk; increased levels are strongly linked to treatment failure in diabetic foot ulcers. Other factors, such as low albumin and low Hb, reveal poor nutritional status and delayed wound healing, thus increasing the risk of amputation. Moreover, ulcers complicated by osteomyelitis (equivalent to Wagner's grade 3) showed a higher risk of lower extremity amputation. Wagner grade offers information into the extent of tissue damage, thereby predicting ulcer outcomes effectively.

Recognizing these predictors is crucial for improving patient management techniques and treatment plans, offering significant potential to preserve limbs and prevent complications.

A multidisciplinary approach is recommended for optimal treatment of these patients, highlighting the importance of considering the severity of the diabetic foot infection, underlying systemic conditions, and the patient's socioeconomic status when evaluating the correct care.

Key points

- Foot ulcers are a major concern for diabetes patients, significantly increasing the risk of lower limb amputation.
- Key predictors of amputation include PAD, high Wagner's grade, markers of infection, and poor nutrition.
- A multidisciplinary approach addressing these factors can enhance management and reduce amputation risks.

Resources:

1. Mansoor Z, Modaweb A. Predicting Amputation in Patients With Diabetic Foot Ulcers: A Systematic Review. *Cureus.* 2022; 14(7):e27245. Published 2022 Jul 25. doi:10.7759/cureus.27245
2. Singh G, Chawla S. Amputation in Diabetic Patients. *Med J Armed Forces India.* 2006; 62(1):36-39. doi:10.1016/S0377-1237(06)80151-6
3. Liao X, Li SH, El Akkawi MM, Fu XB, Liu HW, Huang YS. Surgical amputation for patients with diabetic foot ulcers: A Chinese expert panel consensus treatment guide. *Front Surg.* 2022; 9:1003339. Published 2022 Nov 8. doi:10.3389/fsurg.2022.1003339
4. Walicka M, Raczyńska M, Marcinkowska K, *et al.* Amputations of Lower Limb in Subjects with Diabetes Mellitus: Reasons and 30-Day Mortality. *J Diabetes Res.* 2021;2021:8866126. Published 2021 Jul 24. doi:10.1155/2021/8866126

Interview with Dr. Anurag Nema

Dr. Anurag Nema
MS (General Surgery), FMAS, DMAS
Consultant General and Laparoscopic
Bariatric Surgeon, Icon Hospital, Surat

Dr. Anurag Nema is a highly regarded General and Laparoscopic Surgeon based in Surat, with over 20 years of dedicated practice in the field. He is currently associated with Icon Hospital in Surat. He is known for his skilled surgical interventions and commitment to patient well-being. Dr. Anurag Nema is dedicated to providing top-tier care to his patients.

Diabetes and Surgical Considerations

1. What specific pre-surgical assessments are necessary for diabetes patients?

Ans. In routine surgeries, there are two types; one is emergency surgery. In these cases, we cannot wait to control diabetes, and we have to directly operate on the patient whether the patient's diabetes is under control or not.

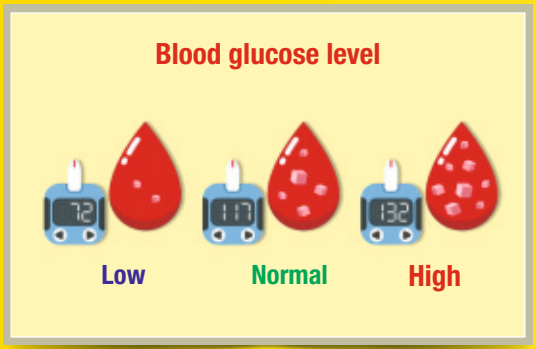
Sometimes, because of infection, the blood glucose levels are very high, so along with glucose levels, we also have to control the infection. For example, in cases of perforation of the appendix or of the intestine, the pus cells are in all parts of the body, or when in septicemia, you cannot wait for the diabetes to come under control. In such cases, we have to operate simultaneously and then keep the patient in intensive care unit (ICU), where the diabetologist or physician will help to control the diabetes. The second scenario is when the patient comes for a routine surgery like a hernia, gallbladder removal, hysterectomy surgery, or any other routine surgery in which the patient can wait, and there is no emergency. In these cases, the patient can wait till the diabetes is brought under control, which could take 15 days to a month. So, blood glucose control is one of the important aspects of pre-surgical assessment. The important pre-surgical assessments include fasting blood glucose, postprandial blood glucose, and hemoglobin A1c (HbA1c).

2. Are there any specific anesthesia considerations for diabetes patients?

Ans. For any surgery, the anesthesia considerations are done by the anesthesiologist. He or she only decides if to proceed with general, local or spinal anesthesia. If the diabetes is under control preference is given to local anesthesia, but it is totally dependent on how the anesthetist attends the patient and how comfortable he is. Usually, as surgeons we do not take decisions with regards to the type of anesthesia.

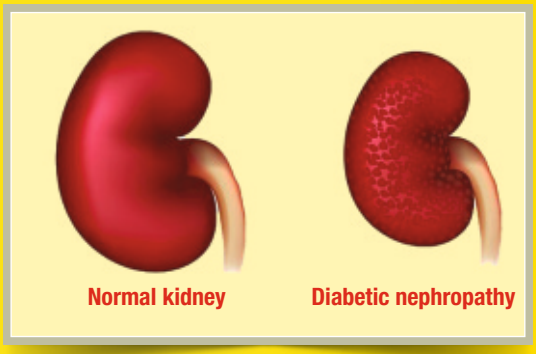
3. What are the risks of hypoglycemia or hyperglycemia during surgery, and how are they mitigated?

Ans. Low blood glucose is more dangerous than high blood glucose that is, blood glucose levels below 70 mg/dL can even cause damage to the brain. So, generally we prefer if the blood glucose levels are more than 70 mg/dL. If the blood glucose levels are less than 60 mg/dL, the patient might have brain damage or might get unconscious which is more difficult to treat rather than hyperglycemia where blood glucose levels are high.



High blood glucose levels can be controlled by insulin. Usually, when a patient comes with high blood glucose levels before surgery, we correct the blood glucose levels by switching the patient from oral medications to insulin because insulin is of short duration, and we can regulate the dosage every 6 hours. So, in case blood glucose levels go up, one can increase the insulin dosage. During the perioperative stage, which is 2 days before the surgery and up to 3–4 days post the surgery, the patient is shifted from oral antidiabetic drugs to insulin so that diabetes can be controlled in a better way.

4. Do individuals with diabetes have higher chances of postoperative complications?



Ans. Yes, definitely. Infections are more common if the blood glucose level is uncontrolled, so we have to be very careful about the antibiotics. In routine surgeries, we do not give antibiotics; however, in uncontrolled blood glucose levels, antibiotics are given for longer periods. So, for a non-diabetic patient, if antibiotics are given for only 3 days, the patient with diabetes will get antibiotics for a longer duration. Due to long-term diabetes, other organs are also involved. For example, the kidney, increasing the risk of complications.

5. How do you approach wound care and prevention of infection post-surgery in people with diabetes?

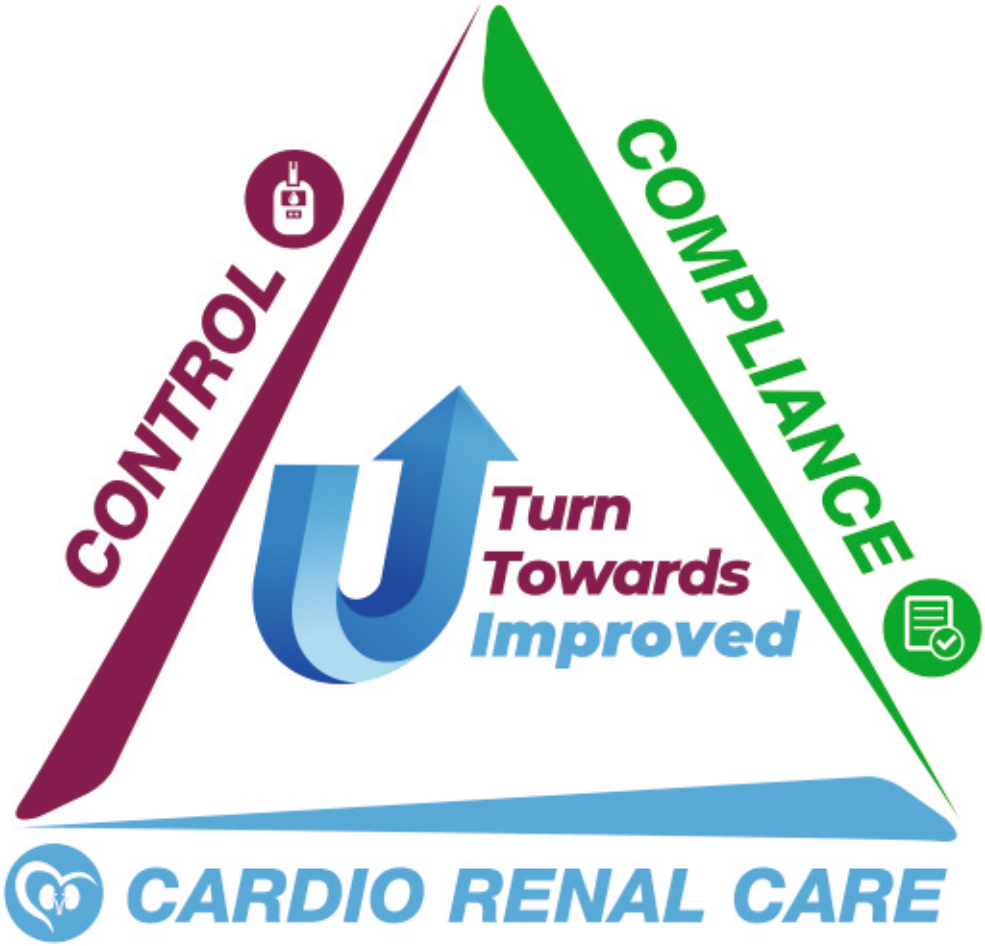
Ans. We definitely take care of all patients, but we are more careful about sepsis in patients with diabetes. Normally, we do swab and culture tests more frequently in patients with diabetes as compared to other patients because they are more prone to infections. Even if we have a minor doubt about infection, we become more careful and are very stringent about antibiotic protocol as compared to a non-diabetic patient. So, in addition to wound care and taking antibiotics to prevent infections, even a healthy diet with an increase in protein for wound healing and tissue repair is recommended. The healing of a patient post-surgery is taken care of by a team, which includes the surgeon, a physician to treat the diabetes, and a dietician to help with the food.

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



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

Abridged Prescribing Information

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

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

In **uncontrolled** T2DM with or at risk of **CVD, HF and CKD**[1]

TREAT EARLY TREAT RIGHT with

UDAPA-S

Dapagliflozin 10 mg + Sitagliptin 100 mg Tablets

U turn to a life 'IN RANGE'

Extensively Studied & Recognized Brand of **Dapagliflozin + Sitagliptin** in India#

Nearly **4000** **Patient Data**

Real World Evidence

From **550+** **Clinicians Across India**

CVD- Cardiovascular Disease HF- Heart Failure CKD- Chronic Kidney Disease
*L Ravikumar et al., Cardiol Cardiovasc Med 2023; 7: 141-144. n= no. of patients | #As per the literature search (PubMed and Google Scholar) on 21st March 2024

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

UDAPA®-S
Dapagliflozin and Sitagliptin Tablets
Composition: Each Film Coated Tablet Contains: Dapagliflozin Propanediol Monohydrate eq. to Dapagliflozin (10 mg) + Sitagliptin Phosphate Monohydrate IP eq. to Sitagliptin (100 mg)
Indications: For the treatment of type 2 diabetes mellitus inadequately controlled on Metformin monotherapy.
Recommended Dosage: As directed by the physician.
Method of Administration: Oral
Adverse Reactions: Female genital mycotic infections, nasopharyngitis, and urinary tract infections are most common adverse reactions associated with dapagliflozin. While, upper respiratory tract infection, nasopharyngitis, and headache are most common adverse reactions associated with sitagliptin.
Warnings and Precautions: Risk of Volume Depletion in Elderly - Before initiating Dapagliflozin and Sitagliptin, assess volume status and renal function in the elderly, patients with renal impairment or low systolic blood pressure, and in patients on diuretics. Monitor for signs and symptoms during therapy. **Ketoacidosis in Patients with Diabetes Mellitus -** Assess patients who present with signs and symptoms of metabolic acidosis for ketoacidosis regardless of blood glucose level. If suspected, discontinue UDAPA®-S, evaluate and treat promptly. Before initiating UDAPA®-S, consider risk factors for ketoacidosis. Patients on UDAPA®-S may require monitoring and temporary discontinuation of therapy in clinical situations known to predispose to ketoacidosis. **Urosepsis and Pyelonephritis -** Evaluate for signs and symptoms of urinary tract infections and treat promptly, if indicated. Hypoglycemia - Consider a lower dose of insulin or the insulin secretagogue to reduce the risk of hypoglycemia when used in combination with Dapagliflozin and Sitagliptin. **Necrotizing Fasciitis of the Perineum -** Serious, life-threatening cases have occurred in patients with diabetes, both females and males. Assess patients presenting with pain or tenderness, erythema, or swelling in the genital or perineal area, along with fever or malaise. If suspected, institute prompt treatment. **Genital Mycotic Infections -** Monitor and treat if indicated.
Contraindications: Patients with a history of hypersensitivity reaction to the active substance or to any of the excipients. In patients with varying degrees of renal impairment, adjusting the dosage is advised based on the severity of the condition. Prohibited medications include strong CYP2C8 inhibitors/ inducers, drugs increasing/decreasing hypoglycemic action, drugs known to cause QT prolongation, or other oral hypoglycemic agents other than study medications.
Updated on 20th March 2024
For Additional Information/full prescribing information, please write to us:

USV Private Limited
Arvind Vithal Gandhi Chowk, B.S.D Marg, Govandi, Mumbai-400088

Managing Uncontrolled Long-standing Diabetes: A Doctor's Experience on the MyCare Patient Support Program

Dr. Sandip Kumar Parui

MD, MRCP (UK), FRCP (Edin)

A woman with uncontrolled type 2 diabetes was managed by Dr. Sandip Kumar Parui.

Here's what Dr. Sandip Kumar Parui has to say:

The patient initially presented with an alarming fasting blood glucose level of 385 mg/dL and a postprandial blood sugar level of 542 mg/dL. Despite living with diabetes for over 20 years and on insulin therapy for more than a decade, her condition remained uncontrolled. Upon assessment, it was identified that her dietary habits were inappropriate and her insulin administration technique was incorrect. I advised her to meet my MyCare Diabetes Educator (MDE), Ms. Russa Banerjee.

The MDE took a detailed understanding of her situation. She counseled her on the right injection administration technique and gave her a demonstration, and also made the patient practice the right technique. She took a diet recall and counseled her on dietary changes required to get better control of blood glucose levels. Following counseling and guidance, significant improvements were observed within a month. Her fasting glucose level reduced from 385 to 148 mg/dL, and her postprandial level dropped from 542 to 84 mg/dL. These improvements were attributed to the proper insulin technique and dietary modifications. Consequently, her total daily dose was reduced from 48 units to 40 units.

Ms. Russa Banerjee

NDEP and T1DE Certified Diabetes Educator

Here's what the MDE Russa Banerjee has to say:

By counseling about diet, insulin techniques and appropriate timing, I empowered her to self-manage her diabetes better, and this knowledge helped her to make wise decisions and achieve her goal of normalizing fasting and post-meal blood glucose levels.

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

Association of C-section Delivery to Risk of Diabetes

Dr. Mukesh Gupta

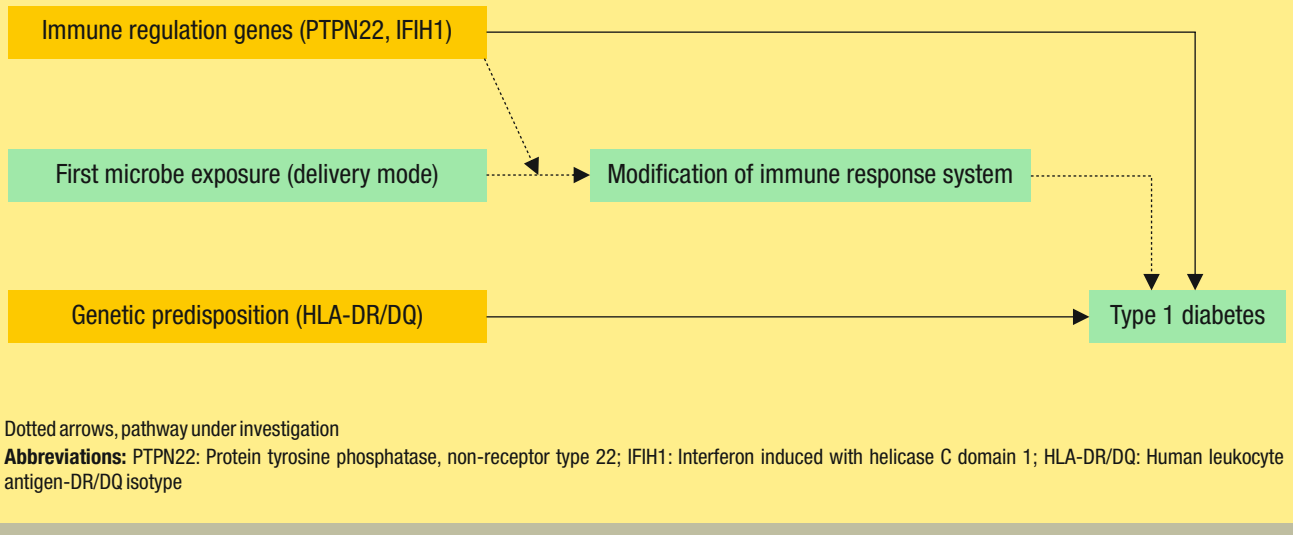
MBBS, MD (Obstetrics and Gynecology), DNB (Obstetrics and Gynecology), PGD in Psychological Counselling

Consultant Obstetrician and Gynecologist, Founder of Le'Nest, Dr. Gupta Nursing Home, Mumbai

Cesarean deliveries (C-sections), often performed for medical reasons or on maternal request, are increasingly common. Increasing evidence suggests that being born by cesarean delivery may have long-term consequences on the health of offspring, one of them being diabetes.

Association with type 1 diabetes (T1D)

A meta-analysis showed a 20% increased risk of T1D with C-sections, independent of factors such as maternal age, birth weight, and breastfeeding. Altered gut microbiota, bacterial exposures, and the hygiene hypothesis have been proposed as explanations. C-section delivery exposes newborns to skin bacteria, lacking protective vaginal bacteria, potentially increasing susceptibility to T1D and other conditions. The interferon induced with helicase C domain 1 (IFIH1) gene, associated with T1D, may enhance the immune response to viruses, increasing T1D risk. Studies suggest a gene-environment interaction, with the highest risk in children exposed to both genetic and environmental factors.



Dotted arrows, pathway under investigation

Abbreviations: PTPN22: Protein tyrosine phosphatase, non-receptor type 22; IFIH1: Interferon induced with helicase C domain 1; HLA-DR/DQ: Human leukocyte antigen-DR/DQ isotype

Figure 1: Hypothesized gene-environment interaction in the pathogenesis of T1D

Association with type 2 diabetes mellitus (T2DM)

Two meta-analyses summarizing data from 24 studies have reported an increased risk of obesity for individuals born by cesarean and also suggest that the elevated risk persists in adult life. Obesity prevailing in adulthood may increase the risk of T2DM. One study found that being born by cesarean delivery was associated with a 11% higher risk of obesity and a 46% higher risk of T2DM. The link between cesarean delivery and T2DM remained significant even after adjusting the body mass index (BMI) during follow-up, indicating that the association with T2DM is only partially mediated by elevated BMI. Altered gut microbiota is also suggested to play a role here. Altered gut microbiota can modulate host energy harvest from the diet and cause bacterial lipopolysaccharide-induced chronic inflammation. These changes in gut microbiota can influence host adiposity and glucose metabolism. Further research is needed to confirm the link between cesarean delivery and T2DM and to explore the biological mechanisms behind the increased risk of obesity and T2DM in offspring born via C-section.

Encouraging vaginal deliveries when possible and appropriate, promoting breastfeeding, and early introduction of beneficial bacteria to C-section-born infants could mitigate obesity and diabetes risk as they help in maintaining healthy gut flora.

Resources:

1. Chavarro JE, Martín-Calvo N, Yuan C, *et al.* Association of Birth by Cesarean Delivery With Obesity and Type 2 Diabetes Among Adult Women. *JAMA Netw Open.* 2020;3(4):e202605. Published 2020 Apr 1. doi:10.1001/jamanetworkopen.2020.2605
2. Vehik K, Dabelea D. Why are C-section deliveries linked to childhood type 1 diabetes?. *Diabetes.* 2012;61(1):36-37. doi:10.2337/db11-1482

Bariatric Surgery and its Effectiveness in Diabetes Management

Dr. Shashank Shah

MBBS, MS, FAIS, FMAS (Hon.), FIAGES (Hon.), FALS (Hon.)

Consultant General and Laparoscopic Bariatric Surgeon, Co-founder and Director of Laparo Obeso Centre, Pune and Mumbai

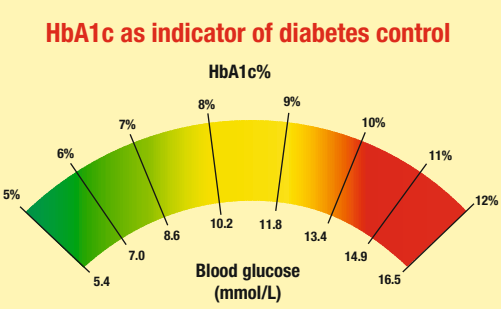
Bariatric surgery has emerged as a significant intervention for the management of obesity and its related comorbidities, such as type 2 diabetes mellitus (T2DM). The profound impact of bariatric surgery on glycemic control, insulin sensitivity, and even the potential remission of T2DM has been well-documented through numerous studies and clinical trials.

Mechanisms of action

Bariatric surgery includes several procedures, such as Roux-en-Y gastric bypass (RYGB), sleeve gastrectomy (SG), and adjustable gastric banding (AGB). These procedures result in weight loss through restriction of food intake, malabsorption of nutrients, or a combination of both. However, their effects on T2DM extend beyond weight loss alone. The metabolic changes induced by bariatric surgery contribute significantly to the improvement or remission of diabetes. These changes include:

1. Enhanced insulin sensitivity: Post-surgery, there is an improvement in insulin sensitivity, which helps in better glucose utilization by the body.
2. Altered gut hormone secretion: Bariatric surgery alters the secretion of gut hormones such as glucagon-like peptide-1 (GLP-1) and pancreatic peptide YY (PYY), which play roles in glucose metabolism and appetite regulation.
3. Bile acid metabolism: Changes in bile acid metabolism post-surgery influence glucose homeostasis.
4. Microbiota changes: Alterations in gut microbiota after surgery contribute to metabolic improvements.

Clinical effectiveness



Remission of T2DM

Studies have shown that bariatric surgery can lead to remission of T2DM, defined as normoglycemia in the absence of diabetes medication. For instance, a meta-analysis reported that 78.1% of patients undergoing RYGB and 50.4% of those undergoing SG achieved remission of T2DM. The remission rates vary depending on the type of surgery and the patient's preoperative characteristics.

Long-term glycemic control

Long-term studies indicate that the benefits of bariatric surgery on glycemic control are sustained over many years. For example, the Swedish obese subjects (SOS) study demonstrated that patients who underwent bariatric surgery maintained lower blood glucose levels and had a reduced need for diabetes medications compared to non-surgical controls up to 20 years post-operation.

Preoperative predictors of remission

Identifying predictors of diabetes remission can help in patient selection and optimizing outcomes. Factors associated with higher remission rates include:

1. Shorter duration of diabetes: Patients with a shorter duration of T2DM (typically less than 5 years) are more likely to achieve remission after surgery.
2. Lower preoperative glycated hemoglobin (HbA1c): Lower baseline HbA1c levels (typically <7.5%) are associated with higher rates of diabetes remission.
3. Younger age: Younger patients tend to have better outcomes in terms of diabetes remission compared to older individuals.
4. Use of fewer diabetes medications: Patients requiring fewer diabetes medications preoperatively are more likely to experience remission.

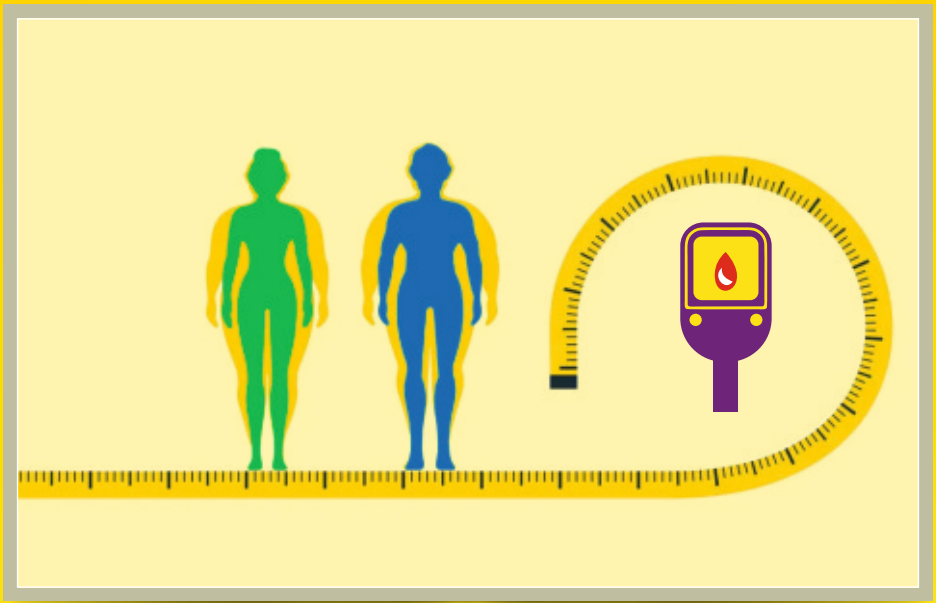
It's important to note that while these factors are associated with higher rates of remission, they do not guarantee success. Individualized assessment and shared decision-making between patients and healthcare providers are crucial when considering bariatric surgery for the management of T2DM.

In conclusion, bariatric surgery is a highly effective treatment for T2DM in patients with obesity. It leads to significant improvements in glycemic control, weight loss, and reduced need for diabetes medications, with the potential for long-term remission. However, close monitoring and ongoing management are essential to maintain these benefits and prevent relapse.

Key points

- Bariatric surgery has emerged as a powerful intervention for managing both obesity and T2DM.
- Its effectiveness extends beyond simple weight loss, inducing significant metabolic changes that contribute to improved glycemic control and potential diabetes remission.
- The primary mechanisms include enhanced insulin sensitivity, altered gut hormone secretion, changes in bile acid metabolism, and modifications to gut microbiota.
- Clinical studies have demonstrated high rates of T2DM remission following procedures like RYGB and SG, with benefits often sustained long-term.

- Preoperative factors such as shorter diabetes duration, lower HbA1c levels, younger age, lower body mass index (BMI), and fewer diabetes medications are associated with higher remission rates.
- While bariatric surgery offers promising outcomes for many patients with T2DM and obesity, individualized assessment and ongoing management remain crucial for optimal results.



Resources:

1. Mahamud B, Suthar RK, Mohamed A, Hamid K, Mlawa G. Effectiveness of Bariatric Surgery in the Management of Type 2 Diabetes Mellitus: A Case Report and Literature Review. *Cureus*. 2023;15(10):e47843. Published 2023 Oct 27. doi:10.7759/cureus.47843
2. Alqunai MS, Alrashid FF. Bariatric surgery for the management of type 2 diabetes mellitus-current trends and challenges: A review article. *Am J Transl Res*. 2022;14(2):1160-1171. Published 2022 Feb 15.
3. Bhandari V, Kosta S, Bhandari M, Bhandari M, Mathur W, Fobi M. Bariatric metabolic surgery: An effective treatment of type 2 diabetes. *J Minim Access Surg*. 2022;18(3):396-400. doi:10.4103/jmas.JMAS_325_20
4. Fultang J, Chinaka U, Rankin J, Bakhshi A, Ali A. Preoperative Bariatric Surgery Predictors of Type 2 Diabetes Remission. *J Obes Metab Syndr*. 2021;30(2):104-114. doi:10.7570/jomes20084
5. Ilyas S, Al-Refai R, Maharjan R, Diaz Bustamante L, Ghattas KN, Khan S. Bariatric Surgery and Type 2 Diabetes Mellitus: Assessing Factors Leading to Remission. A Systematic Review. *Cureus*. 2020;12(8):e9973. Published 2020 Aug 23. doi:10.7759/cureus.9973

Pancreatic Islet Transplantation in Type 1 Diabetes

Dr. Dhrumil Patel

MBBS, MD, FID (UK)

Consultant Diabetologist and Thyroid Specialist, Dr. Dhrumil's Diabetes and Thyroid Speciality Clinic, Ahmedabad

Type 1 diabetes (T1D) requires lifelong insulin injections and ongoing blood glucose monitoring, which poses significant clinical and financial challenges and highlights the need for a medical remedy.

Why pancreatic islet cell transplant?

While insulin can save lives, daily insulin injection therapy does not fully replicate the efficiency of β-cells' endogenous blood glucose regulation. Furthermore, insulin injection therapy is a costly and ongoing burden for people with diabetes, and it does not completely remove the risk of both acute and long-term problems associated with diabetes. Insulin-dependent diabetes, treated by pancreatic islet transplantation, involves isolating pancreatic islets from donors and percutaneously infusing them into the liver through the portal vein. People with T1D have had this treatment done successfully, and the results include exogenous insulin independence for a number of years. Additionally, in terms of preventing diabetes-related complications and enforcing general metabolic control, pancreatic islet transplantation may be more effective than daily insulin therapy.

Hope for T1D individuals

Type 1 diabetes

Pancreatic islet cell transplantation has gained hope in recent years as the best course of treatment for T1D. In 2000, Shapiro *et al.* developed the Edmonton protocol for islet cell transplantation and introduced a glucocorticoid-free immunosuppression regime. In 2006, Shapiro *et al.* reported that 58% of patients who underwent pancreatic islet cell transplantation achieved insulin independence at some point, but 76% required insulin again after 2 years, underscoring the detrimental effects of immunosuppressive drugs. By 2022, Marfil-Garza *et al.* provided evidence of the long-term safety of islet transplantation, showing 90% patient survival and median graft survival of 5.9 years, and highlighted the effectiveness of dual anti-inflammatory therapy (anakinra and etanercept). This aligns with data from the Collaborative Islet Transplant Registry (CITR), which identified key factors for graft survival, such as age ≥35, a high islet infusion count, specific immunosuppressants, and

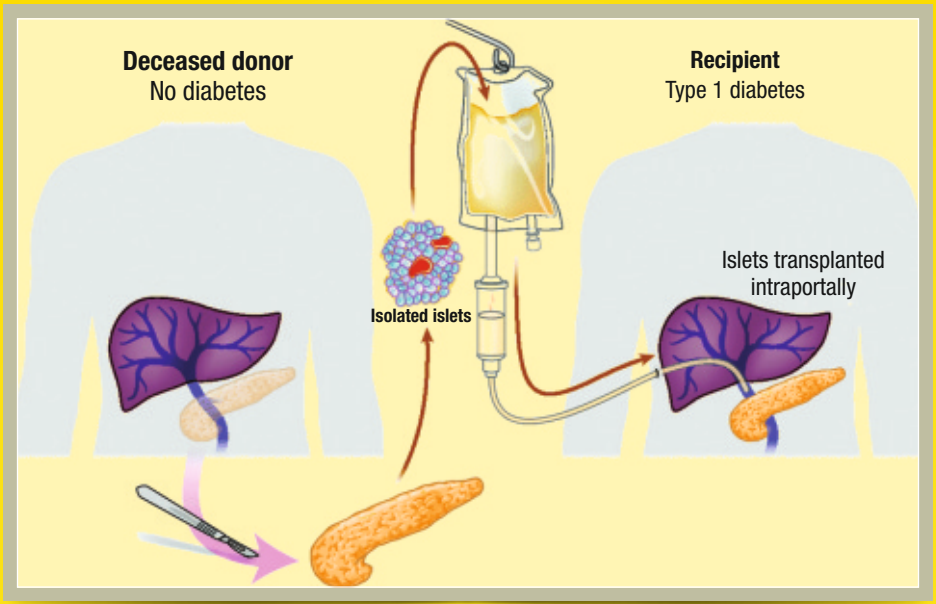
dual therapy, with 53% of patients achieving insulin independence at 5 years. The Lancet study further emphasized the importance of early primary graft function for long-term success, suggesting that optimizing initial graft function could enhance outcomes. Future research should assess whether primary graft function can guide the timing and planning of additional islet cell infusions. Collectively, these studies affirm the efficacy and safety of islet cell transplantation for treating T1D and point to new research directions for improving long-term success. Initially an experimental therapy, islet cell transplantation is now recognized for its significant benefits, including reduced surgical risks and complications.

The challenge

One of the greatest barriers is the required use of chronic immunosuppression to prevent islet cell rejection. Immunosuppression raises concerns on two fronts: Adverse effects on patients and the graft. For patients, systemic immunosuppression can lead to opportunistic infections post-transplant, a higher risk of insulin resistance, and the potential development of neoplasms. From a graft perspective, immunosuppression regimens are associated with islet graft failure and cell apoptosis. Advances in immunosuppressive therapy regimens may help maintain islet engraftment, ensuring prolonged graft function and reducing the risk of graft failure. To effectively convert these findings into a treatment that applies to clinical practice, more ideal transplantation sites and strategies for enhancing islet graft survival are required. Despite its effectiveness, islet transplantation is not widely applicable due to the scarcity of islet donors and the side effects resulting from the continuous requirement for immunosuppression. To enhance islet graft longevity and streamline immune modulation, novel transplantation methods are imperative for the long-term viability of islet cell therapy in the management of diabetes.

Key points

- T1D requires lifelong insulin therapy and ongoing monitoring, presenting significant challenges and highlighting the need for a better solution.
- Islet cell transplantation offers a potential remedy by providing insulin independence and improving glucose control but is limited by issues like the toxicity of immunosuppressive drugs and the scarcity of donors.
- Recent studies, including those from Shapiro *et al.*, Marfil-Garza *et al.*, and the CITR, show that while islet transplantation can offer long-term benefits and improve metabolic control, challenges remain.
- Innovations in immunosuppressive regimens and transplantation techniques are needed to enhance graft survival and make this treatment more widely applicable.



Resources:

1. Kuo CH, Li HY. Pancreatic islet transplantation in type1 diabetes: Current state and future perspectives. *J Diabetes Investig.* 2023;14(2):183-185. doi:10.1111/jdi.13942
2. Czarnecka Z, Dadheech N, Razavy H, Pawlick R, Shapiro AMJ. The Current Status of Allogenic Islet Cell Transplantation. *Cells.* 2023;12(20):2423. Published 2023 Oct 10. doi:10.3390/cells12202423

Prognosis of Coronary Artery Bypass Graft (CABG) Surgery in Diabetes

Dr. Vitrag Shah

MBBS, C. Diab.

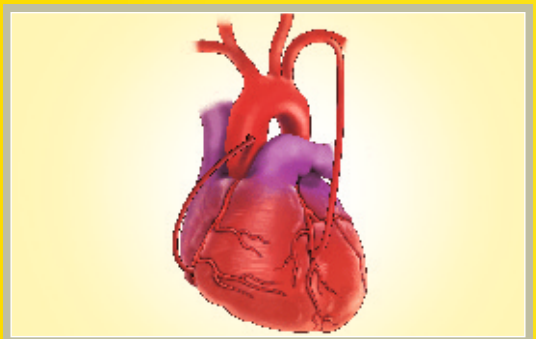
Consultant Diabetologist, Achintya Wellness, Surat

People with diabetes (PWD) face an increased risk of cardiovascular disorders, with a 4.4-fold higher likelihood of developing these conditions. As a major risk factor for coronary artery disease (CAD), diabetes mellitus (DM) complicates the prognosis of cardiovascular diseases and related procedures. PWD often presents with intricate CAD patterns, including multiple lesions and extensive disease, which complicates vascularization.

Short-term outcomes

Immediately post-CABG surgery, DM does not significantly impact in-hospital mortality rates. Studies have consistently shown that PWD and those without diabetes have similar short-term outcomes post-CABG. Short-term studies found no significant differences in 30-day mortality rates among PWD and those without diabetes. These findings are consistent across various studies; therefore, while PWD tends to have more comorbidities, these factors may not significantly alter the immediate surgical outcomes.

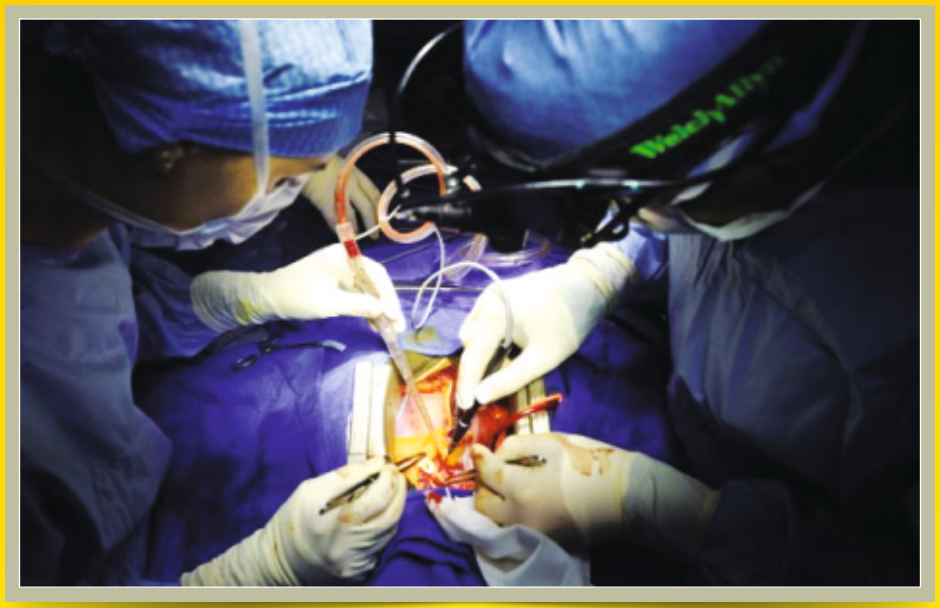
Long-term outcomes



In contrast, DM has a pronounced impact on long-term outcomes post-CABG. PWD face higher long-term mortality compared to those without diabetes. Studies observed that PWD had a 52% higher risk of 7-year mortality and a 31% increase in major adverse cardiovascular and cerebrovascular events (MACCE). Insulin-dependent PWD, in particular, was found to have higher mortality rates compared to those treated with oral anti-hyperglycemic medications. A study reported that 3- and 5-year mortality rates were higher in PWD compared to those without diabetes (11% vs. 9.7% and 19.6% vs. 16.2%, respectively).

The long-term survival rate is affected by the complexity of CAD in PWD. They are more likely to develop macrovascular complications such as myocardial infarction, stroke, and peripheral vascular disease, contributing to higher long-term mortality rates.

CABG surgery in PWD presents unique challenges due to the complex nature of CAD and the increased risk of postoperative complications. Despite this, the prognosis can be improved with meticulous perioperative management, long-term follow-up, and lifestyle modifications to ensure sustained benefits from the surgery.



Resources:

1. Moutakiallah Y, Boulahya A, Seghrouchni A, *et al.* Coronary artery bypass surgery in type 2 diabetic patients: Predictors of mortality and morbidity. *Cardiothorac Surg.* 2019;27:6. doi:10.1186/s43057-019-0009-5
2. Nomali M, Ayati A, Tayebi A, *et al.* Type 2 diabetes mellitus and In-hospital Major Adverse Cardiac and Cerebrovascular Events (MACCEs) and postoperative complications among patients undergoing on-pump isolated coronary artery bypass surgery in Northeastern Iran. *BMC Cardiovasc Disord.* 2023;23(1):130. Published 2023 Mar 11. doi:10.1186/s12872-023-03163-5
3. Pezeshki PS, Masoudkabir F, Pashang M, *et al.* 7-year outcomes in diabetic patients after coronary artery bypass graft in a developing country. *BMC Cardiovasc Disord.* 2023;23(1):248. Published 2023 May 12. doi:10.1186/s12872-023-03279-8
4. Kogan A, Ram E, Levin S, *et al.* Impact of type 2 diabetes mellitus on short- and long-term mortality after coronary artery bypass surgery. *Cardiovasc Diabetol.* 2018;17(1):151. Published 2018 Nov 29. doi:10.1186/s12933-018-0796-7

Frequently Asked Questions on Diabetes and Surgical Considerations

Dr. Savitri Gorakh

MBBS, D. Diab., F. Diab., D. Nutrition

Consultant Diabetologist and Family Physician,
Dr. Gorakh's We Care Clinic, Mumbai

1. My 62-year-old father suffers from long-standing diabetes. He is undergoing diabetic foot surgery. What specific steps should I be mindful of to ensure his blood sugar levels are well-managed after the surgery?

Ans. Managing blood sugar levels after surgery is crucial, especially for individuals with diabetes. Here are detailed steps to ensure optimal blood sugar control:

- **Regular blood sugar monitoring:** It is essential to monitor blood glucose levels frequently, ideally every few hours initially, as surgery and associated stress can cause fluctuations that need immediate attention.
- **Check for infection:** High blood sugar levels can increase the risk of infection around surgical wounds. It's crucial to monitor for any signs of infection, such as redness, swelling, or discharge, and promptly report these to the healthcare provider.
- **Nutrition guidance:** A balanced diet is critical. Ensure your father eats regular meals with a combination of low glycemic index carbohydrates, proteins, and healthy fats. Check with your nutritionist for a detailed, customized meal plan. Avoid sugary foods and beverages to prevent spikes in blood sugar.
- **Medication adherence and adjustment:** Ensure your father continues taking his diabetes medications exactly as prescribed. Depending on their blood sugar readings and the type of surgery, adjustments in insulin doses or oral medications may be necessary to maintain stable glucose levels. Keep checking about the same with your doctor and healthcare team.
- **Stress management:** Stress can elevate blood sugar levels. Techniques such as deep breathing and meditation can help manage stress during the recovery period.
- **Open communication:** Keep an open line of communication with the healthcare team. Inform them of any changes in blood sugar levels, medication responses, or any other concerns.

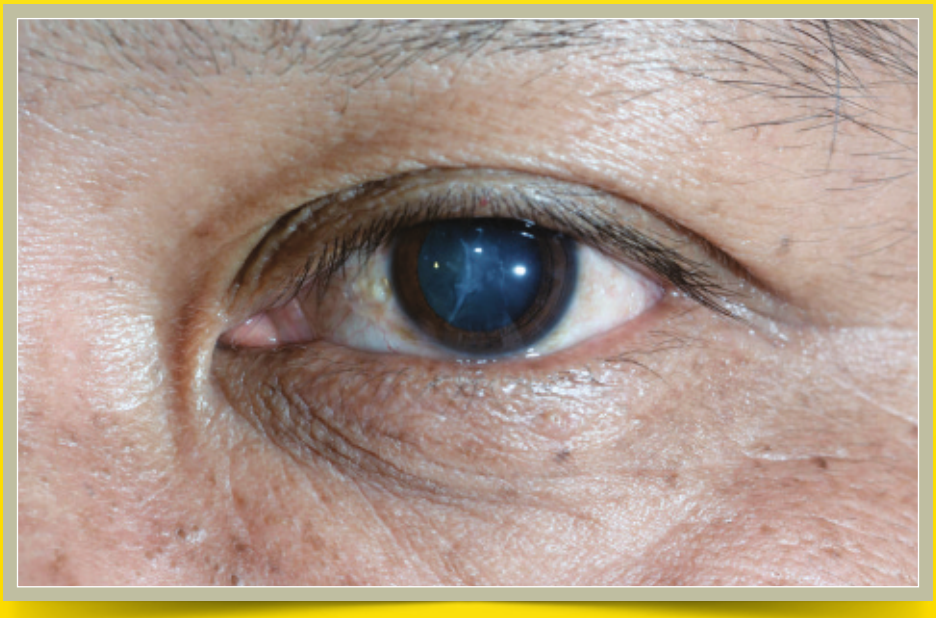
2. I'm pregnant and have been diagnosed with gestational diabetes mellitus (GDM). I've heard that this might increase my chances of needing a cesarean (C-section). Can you explain why that is the case?

Ans. Pregnant women with GDM are at a higher risk of C-section delivery for several reasons. GDM increases the likelihood of "macrosomia," where the baby grows larger than average, complicating vaginal delivery and increasing the risk of shoulder dystocia, a condition where the baby's shoulder gets stuck during birth.

Additionally, GDM could also lead to polyhydramnios (excessive accumulation of amniotic fluid), which could lead to pre-term labor or difficulties during labor, necessitating a C-section delivery. Furthermore, GDM is associated with other complications, such as pre-eclampsia and hypertension, which can pose significant risks to both the mother and baby, often leading to the decision for a C-section to ensure a safer delivery. The overall increased risk of fetal distress and the need for careful monitoring and timely intervention also contribute to the higher likelihood of C-sections in women with GDM.

3. I have type 2 diabetes, and my blood glucose levels have been uncontrolled for some time. Recently, I've noticed that my eyesight is deteriorating. I've heard that this could mean I might need cataract surgery. Can you explain how uncontrolled diabetes affects eyesight and how it could lead to cataract surgery?

Ans. Uncontrolled type 2 diabetes can severely impact your eyesight, increasing the risk of cataracts and other eye issues. High blood glucose levels damage eye blood vessels, leading to diabetes retinopathy and glaucoma. It also causes swelling in the lens and sorbitol build-up, leading to faster-forming cataracts. Symptoms like blurry vision, night vision problems, light sensitivity, and double vision are markers of eye issues. Cataract surgery may be needed if vision is significantly impaired. Controlling blood glucose levels, switching to a healthy lifestyle, and regular eye check-ups are crucial in preventing any complications. Consult your healthcare provider if you notice any vision changes.



Myth and Fact

Myth: Curd cannot be eaten post-surgery as it can cause pus.

Fact: Curd can be eaten post-surgery as it provides good quality protein.

People have a common misconception that curd cannot be eaten post-surgery as it may cause pus. However, consumption of curd can prove to be beneficial in recovery phase post-surgery.

Curd is recognized as a functional health food, and here's how it can be beneficial for health post-surgery:

- **Source of probiotics:** Curd and yogurt are one of the most prominent probiotic sources which have been shown to benefit the gut microflora composition by lowering the counts of harmful bacteria and maintaining healthy gut microflora. This also benefits immune system functioning.
- **Rich in calcium:** Curd is a rich source of many vitamins and minerals, with calcium being the most abundant. Dairy products also contain galacto-oligosaccharides and casein phosphopeptides, which aid in calcium absorption.
- **High biological value protein:** Like other dairy products, curd is also a good source of high biological value protein and is easily absorbed by the body. Due to its protein-rich nature, it also contributes to the immune system's functioning, as antibodies are proteins in nature.

The post-surgery body needs high-quality protein to rebuild and repair body tissues, compensate for muscle loss, and speed recovery. Curd, in addition to muscle synthesis, will also improve intestinal health, which may be compromised due to the intake of antibiotics post-surgery. To date, there is no scientific evidence correlating curd consumption and increased pus formation. Given the benefits discussed, it will indeed be advantageous for supporting immune response, aiding wound healing, and preventing infections after surgery.

Resources:

1. Das SP, Patri M, Mohanty PK. Therapeutic Uses of Curd: A Review. *IOSR Journal of Environmental Science, Toxicology and Food Technology.* 2019;13(1):1-4.
2. Sumi K, Tagawa R, Yamazaki K, *et al.* Nutritional Value of Yogurt as a Protein Source: Digestibility/Absorbability and Effects on Skeletal Muscle. *Nutrients.* 2023;15(20):4366. Published 2023 Oct 14. doi:10.3390/nu15204366

Dia-Games

True or False

1. Tight glycemic control before surgery is not important for patients with diabetes.
2. People with diabetes are likely to experience cardiovascular complications during surgery.
3. In people with diabetes, delayed gastric emptying (gastroparesis) is a concern that may affect anesthesia management.
4. Preoperative screening for diabetic nephropathy is unnecessary if the patient's kidneys are functioning normally.
5. Diabetes can lead to peripheral neuropathy, which increases the risk of pressure ulcers.
6. People with diabetes are at a lower risk of developing hyperglycemia during the perioperative period.
7. Postoperative rehabilitation and wound care protocols do not need insulin or medicine adjustment for people with diabetes.

Answers

1. False
2. True
3. True
4. False
5. True
6. False
7. False

NOTES

Choose GREEN

Glycomet®-GP

Metformin Hydrochloride 500/850/1000 mg SR + Glimepiride 0.5/1/2/3/4 mg

Widely available range for Individualised needs of the patients Across T2DM Continuum

Glycomet®-GP 1
Metformin Hydrochloride 500 mg SR + Glimepiride 1 mg

Glycomet®-GP 3/850
Metformin Hydrochloride 850 mg SR + Glimepiride 3 mg

Glycomet®-GP 0.5
Metformin Hydrochloride 500 mg SR + Glimepiride 0.5 mg

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

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

Glycomet®-GP 0.5 FORTE
Metformin Hydrochloride 1000 mg SR + Glimepiride 0.5 mg

Glycomet®-GP 4 FORTE
Metformin Hydrochloride 1000 mg SR + Glimepiride 4 mg

Glycomet®-GP 1 FORTE
Metformin Hydrochloride 1000 mg SR + Glimepiride 1 mg

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

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

Abridged Prescribing Information

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

Additional information is available on request.

Last updated: March 13, 2023

*In case of any adverse events, kindly contact: pv@usv.in

For the use of registered medical practitioner, hospital or laboratory.*

USV Private Limited

Corvette Team

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

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

USV

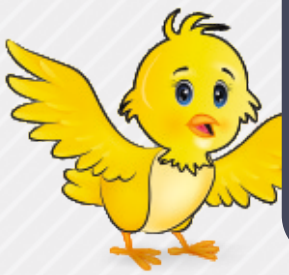
is making

Indian Diabetes Risk Score

Accessible to Every INDIAN

For Screening people with High & Moderate Risk of Diabetes

TO KNOW YOUR RISK OF DIABETES SCAN HERE



Beat Diabetes Win Life

USV

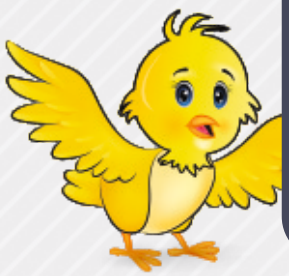
is making

Indian Diabetes Risk Score

Accessible to Every INDIAN

For Screening people with High & Moderate Risk of Diabetes

TO KNOW YOUR RISK OF DIABETES SCAN HERE



Beat Diabetes Win Life

USV

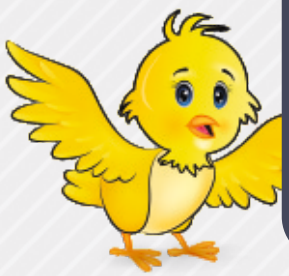
is making

Indian Diabetes Risk Score

Accessible to Every INDIAN

For Screening people with High & Moderate Risk of Diabetes

TO KNOW YOUR RISK OF DIABETES SCAN HERE



Beat Diabetes Win Life

NOTES

NOTES

NOTES

In T2DM Across Continuum,

Choose

Glycomet®-GP

Metformin Hydrochloride 500/850/1000 mg SR + Glimepiride 0.5/1/2/3/4 mg

Green energy

Recycle, Reduce & Reuse

Wat**E**r Neutrality

Eco-friendly manufacturing Facility

No Human Intervention

With New Age GREENTECH#

Technology innovation

Energy efficient

Carbon footprint reduction

High Standard Quality

ICH: International Council of Harmonisation

** AIOCD FEB'24 MAT data # Data on File*

Abridged Prescribing Information

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

Additional information is available on request.

Last updated: March 13, 2023

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

USV Private Limited Corvette Team

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

Scan the QR code to access full library of IDEJ -
https://usvmed.com/