

Chapter 1 : Blood Glucose Monitoring Market Size, Share, Forecast ()

Testing your blood sugar level is one of the best ways to understand your diabetes and how different foods, medications, and activities affect your diabetes. Keeping track of your blood glucose.

Purpose[edit] Blood glucose monitoring reveals individual patterns of blood glucose changes, and helps in the planning of meals, activities, and at what time of day to take medications. This might include diet adjustments, exercise, and insulin as instructed by the health care provider. Glucose meter Four generations of blood glucose meter, c. Sample sizes vary from 30 to 0. Test times vary from 5 seconds to 2 minutes modern meters typically require less than 15 seconds. A blood glucose meter is an electronic device for measuring the blood glucose level. A relatively small drop of blood is placed on a disposable test strip which interfaces with a digital meter. Within several seconds, the level of blood glucose will be shown on the digital display. Needing only a small drop of blood for the meter means that the time and effort required for testing is reduced and the compliance of diabetic people to their testing regimens is improved. Although the cost of using blood glucose meters seems high, it is believed to be a cost benefit relative to the avoided medical costs of the complications of diabetes. This alternate site testing uses the same test strips and meter, is practically pain free, and gives the finger tips a needed break if they become sore. The disadvantage of this technique is that there is usually less blood flow to alternate sites, which prevents the reading from being accurate when the blood sugar level is changing. Two approaches have resulted in systems that no longer require coding. Some systems use a cartridge or a disc containing multiple test strips. Most newer systems come with software that allows the user to download meter results to a computer. This information can then be used, together with health care professional guidance, to enhance and improve diabetes management. The meters usually require a connection cable, unless they are designed to work wirelessly with an insulin pump, are designed to plug directly into the computer, or use an infrared connection. Continuous glucose monitoring[edit] A continuous glucose monitor determines glucose levels on a continuous basis every few minutes. A typical system consists of: Continuous glucose monitors measure the concentration of glucose in a sample of interstitial fluid. Shortcomings of CGM systems due to this fact are: The lag time discussed above has been reported to be about 5 minutes. This lag time is insignificant when blood sugar levels are relatively consistent. However, blood sugar levels, when changing rapidly, may read in the normal range on a CGM system while in reality the patient is already experiencing symptoms of an out-of-range blood glucose value and may require treatment. Patients using CGM are therefore advised to consider both the absolute value of the blood glucose level given by the system as well as any trend in the blood glucose levels. Continuous monitoring allows examination of how the blood glucose level reacts to insulin, exercise, food, and other factors. The additional data can be useful for setting correct insulin dosing ratios for food intake and correction of hyperglycemia. Monitoring during periods when blood glucose levels are not typically checked e. Monitors may also be equipped with alarms to alert patients of hyperglycemia or hypoglycemia so that a patient can take corrective actions after fingerstick testing, if necessary even in cases where they do not feel symptoms of either condition. While the technology has its limitations, studies have demonstrated that patients with continuous sensors experience less hyperglycemia and also reduce their glycosylated hemoglobin levels. However, an increasing number of insurance companies do cover continuous glucose monitoring supplies both the receiver and disposable sensors on a case-by-case basis if the patient and doctor show a specific need. The lack of insurance coverage is exacerbated by the fact that disposable sensors must be frequently replaced. Some sensors have been U. Food and Drug Administration FDA approved for 7- and 3-day use, although some patients wear sensors for longer than the recommended period and the receiving meters likewise have finite lifetimes less than 2 years and as little as 6 months. This is one factor in the slow uptake in the use of sensors that have been marketed in the United States. The principles, history and recent developments of operation of electrochemical glucose biosensors are discussed in a chemical review by Joseph Wang. A significant improvement of diabetes therapy might be achieved with an implantable sensor that would continuously monitor blood sugar levels within the body and transmit the measured data outside. The burden of regular

blood testing would be taken from the patient, who would instead follow the course of their glucose levels on an intelligent device like a laptop or a smart phone. Glucose concentrations do not necessarily have to be measured in blood vessels, but may also be determined in the interstitial fluid, where the same levels prevail with a time lag of a few minutes due to its connection with the capillary system. However, the enzymatic glucose detection scheme used in single-use test strips is not directly suitable for implants. One main problem is caused by the varying supply of oxygen, by which glucose is converted to gluconolactone and H₂O₂ by glucose oxidase. Since the implantation of a sensor into the body is accompanied by growth of encapsulation tissue, [11] the diffusion of oxygen to the reaction zone is continuously diminished. This decreasing oxygen availability causes the sensor reading to drift, requiring frequent re-calibration using finger-sticks and test strips. One approach to achieving long-term glucose sensing is to measure and compensate for the changing local oxygen concentration. Noninvasive glucose monitor

Some new technologies to monitor blood glucose levels will not require access to blood to read the glucose level. Non-invasive technologies include near IR detection, [22] ultrasound [23] and dielectric spectroscopy. Most [citation needed] of the non-invasive methods under development are continuous glucose monitoring methods and offer the advantage of providing additional information to the subject between the conventional finger stick, blood glucose measurements and over time periods where no finger stick measurements are available i. Effectiveness [edit] For patients with diabetes mellitus type 2, the importance of monitoring and the optimal frequency of monitoring are not clear. A study found no evidence that blood glucose monitoring leads to better patient outcomes in actual practice. A recent study included 12 randomized controlled trials and evaluated outcomes in patients. Furthermore, the same study identified that patients with type 2 diabetes mellitus diagnosed greater than one year prior to initiation of SMBG, who were not on insulin, experienced a statistically significant reduction in their HbA1C of 0. Conversely, newly diagnosed patients experienced a statistically significant reduction of 0. Insulin-dependent type 2 diabetics do not need to monitor their blood sugar as frequently as type 1 diabetics. Recommendations [edit] The National Institute for Health and Clinical Excellence NICE, UK released updated diabetes recommendations on 30 May, which recommend that self-monitoring of plasma glucose levels for people with newly diagnosed type 2 diabetes must be integrated into a structured self-management education process. Why, when and how". Mayo Foundation for Medical Education and Research. Retrieved 27 April Standards of medical care in diabetes" Diabetes Care ; Toward the Development of an Implantable Sensor". Diabetes Digital Media Ltd. Med Care Res Rev. A meta-analysis of 47 randomised controlled trials". Patient Education and Counseling. Journal of diabetes science and technology.

Blood glucose monitoring is a way of testing the concentration of glucose in the blood (). Particularly important in diabetes management, a blood glucose test is typically performed by piercing the skin (typically, on the finger) to draw blood, then applying the blood to a chemically active disposable 'test-strip'.

Continuous Glucose Monitoring What is continuous glucose monitoring? Continuous glucose monitoring automatically tracks blood glucose levels, also called blood sugar, throughout the day and night. You can see your glucose level anytime at a glance. You can also review how your glucose changes over a few hours or days to see trends. Seeing glucose levels in real time can help you make more informed decisions throughout the day about how to balance your food, physical activity, and medicines. How does a continuous glucose monitor CGM work? A CGM works through a tiny sensor inserted under your skin, usually on your belly or arm. The sensor measures your interstitial glucose level, which is the glucose found in the fluid between the cells. The sensor tests glucose every few minutes. A transmitter wirelessly sends the information to a monitor. The monitor may be part of an insulin pump or a separate device, which you might carry in a pocket or purse. Some CGMs send information directly to a smartphone or tablet. A transmitter sends data to a receiver. The CGM receiver may be part of an insulin pump, as shown here, or a separate device. Many CGMs have special features that work with information from your glucose readings: An alarm can sound when your glucose level goes too low or too high. You can note your meals, physical activity, and medicines in a CGM device, too, alongside your glucose levels. You can download data to a computer or smart device to more easily see your glucose trends. That means you can make changes to your diabetes care plan based on CGM results alone. With other models, you must first confirm a CGM reading with a finger-stick blood glucose test before you take insulin or treat hypoglycemia. The glucose reading should be similar on both devices. You should follow your treatment plan to bring your glucose into the target range, or get help. CGM glucose readings need to be checked against a standard glucose meter twice a day. Who can use a CGM? Most people who use CGMs have type 1 diabetes. Research is underway to learn how CGMs might help people with type 2 diabetes. Some models may be used for children as young as age 2. Your doctor may recommend a CGM if you or your child: What are the benefits of a CGM? Compared with a standard blood glucose meter, using a CGM system can help you better manage your glucose levels every day have fewer low blood glucose emergencies need fewer finger sticks A graphic on the CGM screen shows whether your glucose is rising or dropping—and how quickly—so you can choose the best way to reach your target glucose level. Over time, good management of glucose greatly helps people with diabetes stay healthy and prevent complications of the disease. People who gain the largest benefit from a CGM are those who use it every day or nearly every day. What are the limits of a CGM? Researchers are working to make CGMs more accurate and easier to use. But you still need a finger-stick glucose test twice a day to check the accuracy of your CGM against a standard blood glucose meter. For example, before changing your insulin dose, you must first confirm a CGM reading by doing a finger-stick glucose test. A CGM system is more expensive than using a standard glucose meter. Check with your health insurance plan or Medicare to see whether the costs will be covered. What is an artificial pancreas? An artificial pancreas replaces manual blood glucose testing and the use of insulin shots. A single system monitors blood glucose levels around the clock and provides insulin or both insulin and a second hormone, glucagon, automatically. The system can also be monitored remotely, for example by parents or medical staff. In , the U. Food and Drug Administration approved a type of artificial pancreas system called a hybrid closed-loop system. This system tests your glucose level every 5 minutes throughout the day and night through a CGM, and automatically gives you the right amount of basal insulin, a long-acting insulin, through a separate insulin pump. You will still need to test your blood with a glucose meter a few times a day. The hybrid closed-loop system may free you from some of the daily tasks needed to keep your blood glucose stable—or help you sleep through the night without the need to wake and test your glucose or take medicine. Talk with your health care provider about whether this system might be right for you. The NIDDK has funded and continues to fund several important studies on different types of artificial pancreas devices to

better help people with type 1 diabetes manage their disease. The devices may also help people with type 2 diabetes and gestational diabetes. The NIDDK translates and disseminates research findings through its clearinghouses and education programs to increase knowledge and understanding about health and disease among patients, health professionals, and the public.

Chapter 3 : Blood Sugar Monitoring: When to Check and Why - Diabetes Self-Management

iHealth Wireless Smart Glucometer for Apple and Android, Bluetooth Blood Glucose Meter And Monitoring System for Diabetes and Fitness, Comes With Lancing Device and 10 Lancets out of 5 stars \$

Sign up now Blood sugar testing: Why, when and how Blood sugar testing is an important part of diabetes care. Find out when to test your blood sugar level, how to use a testing meter and more. By Mayo Clinic Staff

If you have diabetes, self-testing your blood sugar blood glucose can be an important tool in managing your treatment plan and preventing diabetes complications. You can test your blood sugar at home with a portable electronic device glucose meter that measures sugar level in a small drop of your blood. Why test your blood sugar Blood sugar testing “ or self-monitoring blood glucose ” provides useful information for diabetes management. It can help you: In general, the frequency of testing depends on the type of diabetes you have and your treatment plan. Your doctor may recommend blood sugar testing four to 10 times a day if you have type 1 diabetes. You may need to test before meals and snacks, before and after exercise, before bed, and sometimes during the night. You may also need to check your blood sugar level more often if you are ill, change your daily routine or begin a new medication. If you take insulin to manage type 2 diabetes, your doctor may recommend blood sugar testing a few times a day, depending on the type and amount of insulin you use. You may need to test only twice daily, before breakfast and dinner if you only use a long-acting insulin. If you manage type 2 diabetes with noninsulin medications or with diet and exercise alone, you may not need to test your blood sugar daily. What if you have a continuous glucose monitor CGM? People treated with insulin, particularly those with type 1 diabetes, may also choose to use a CGM. These devices measure your blood sugar every few minutes using a sensor inserted under the skin. Some devices show your blood sugar reading at all times on a receiver, and an alarm will go off if your blood sugar is going up or going down too quickly. Others require that you check your blood sugar by running the receiver over the sensor periodically. Most of these devices still require finger-stick checks to calibrate the machine. Know your target range Your doctor will set target blood sugar test results based on several factors, including: The meter reads the amount of sugar in a small sample of blood, usually from your fingertip, that you place on a disposable test strip. Your doctor or diabetes educator can recommend an appropriate device for you. Your doctor or diabetes educator can also help you learn how to use a meter. Follow the instructions that come with your glucose meter. Wash and dry your hands well. Insert a test strip into your meter. Prick the side of your fingertip with the needle lancet provided with your test kit. Gently squeeze or massage your finger until a drop of blood forms. Touch and hold the edge of the test strip to the drop of blood. The meter will display your blood glucose level on a screen after a few seconds. Recording your results Talk with your doctor about how often you need to record your blood sugar results. Many devices can now be downloaded to a computer. When you manually log your results, record the date, time, test results, medication and dose, and diet and exercise information. Bring your record of results with you to all appointments with your doctor. Avoiding problems with meter usage Blood sugar meters need to be used and maintained properly. Follow these tips to ensure proper usage: Follow the user manual for your device “ procedures may vary from one device to another. Use a blood sample size as directed in the manual. Use only test strips designed for your meter. Store test strips as directed. Clean the device and run quality-control checks as directed. Bring the meter to your doctor appointments to address any questions and to demonstrate how you use your meter.

Chapter 4 : FDA approves first blood sugar monitor without finger pricks - STAT

Can you test blood glucose from sites other than your fingers? Some meters allow you to test blood from sites other than the fingertip. Examples of such alternative sampling sites are your palm.

Blood glucose monitoring devices are used for effective diabetes diagnosis and treatment. Global Rise in Diabetic population Diabetes is a chronic disorder, which occurs when the pancreas is unable to produce insulin required for the body or when the body fails to use the insulin which is produced by the pancreas. Diabetes is caused by several factors, such as sedentary lifestyle, obesity, unhealthy diets, pollution, and others. The incidence and prevalence of diabetes is increasing rapidly. Once diabetes is diagnosed, it is a life time treatment. According to WHO statistics, the prevalence of diabetes in the African region has increased from 3. In Europe, the prevalence of diabetes has increased from 5. In Asia-Pacific, the prevalence of diabetes has increased from 4. There is a huge requirement of glucose monitoring devices for diagnosis and treatment of diabetes. Hence, a rise in the diabetic population drives the market by increasing the use of blood glucose monitoring devices. The other factors, such as technological innovations, the convenience of Conventional Glucose Monitoring over conventional monitoring, early detection of hypo and hyperglycaemic diabetes are the major drivers for the market. Less Attractive Reimbursement Coverage Laboratories are a crucial part of glucose monitoring. As a result, the labs will receive less revenue for the same volume of tests. This applies to tests that exist now and has already obtained Medicare coverage. The cuts in reimbursement rates have led to uncertainties in lab investments, which is a major restraining factor for the growth of glucose monitoring devices market. The other factors such as reimbursement issues and patent expiry depleted profit of market are the major restraints for the blood glucose monitoring market. Asia Pacific Leads the Blood Glucose Monitoring Market In , Asia Pacific held the largest share in the blood glucose monitoring market due to the large patient pool and wide acceptance of advanced technologies. Medtronic received FDA approval for new smart continuous glucose monitor for diabetes. Abbott received FDA approval for first continuous glucose monitoring system for adults not requiring blood sample calibration. Identify the segment that is expected to dominate the market. Identify the regions that are expected to witness the fastest growth during the forecast period. Identify the latest developments, market shares, and strategies employed by the major market players. Please connect with our representative, who will ensure you to get a report that suits your needs.

Chapter 5 : Best Blood Glucose Meter Reviews – Consumer Reports

Blood Glucose Monitors at Walgreens. View current promotions and reviews of Blood Glucose Monitors and get free shipping at \$

Blood testing meters New meters come on the market all the time, so it can be tricky choosing the right one. If you have sight problems, you may not be able to use some meters so your healthcare team can suggest alternatives. Some people can get meters on prescription. But if you choose to buy your own meter, you might not get a prescription for the test strips it uses. Chat to your healthcare team. If this happens to you, take it up with your GP practice.

Finger-prick devices and lancets Finger-prick devices pierce the skin with a needle so that a drop of blood can be taken for testing. The needle is called a lancet. You can adjust the device to change how far it goes into the skin. Lancets come in different sizes and thicknesses or gauges. A higher-gauge lancet is thinner so is normally less painful, but it might not always give you enough blood. You can only use a lancet once or they get blunt and are painful to use.

How to do a finger-prick test Your healthcare team will show you how to do it the first time, but these are the key steps: Wash your hands with soap and warm water. Take a test strip and slot it into the meter to turn it on. Some meters will have tests strips built in. Remove the cap from your finger prick device and put in a new lancet. Then put the cap back on and set the device by pulling or clicking the plunger. Choose which finger to prick but avoid your thumb or index finger finger next to your thumb. Place the device against the side of your finger and press the plunger. Use a different finger each time and a different area. Take your meter with the test strip and hold it against the drop of blood. Before you look at your reading, check your finger. Use a tissue to stop bleeding, then use it to take out the lancet and throw it away in your sharps bin. By this time, your meter will probably show the result. You can use the same tissue to take out the test strip and throw that away too. Taking out the strip will usually turn the meter off. Make a note of your readings It may sound obvious, but you must record your readings. Note them down in a diary, a notebook or in your phone calendar. Some meters have software that lets you do this. You could try a diabetes app too. You and your healthcare team can then look back over your results to see if you need to adjust your treatment.

A mole is a scientific unit often used to measure chemicals. Flash glucose monitors More and more people with diabetes are choosing to use a flash glucose monitor to check their blood sugar levels. The main brand is called the FreeStyle Libre. It measures the amount of sugar in the fluid surrounding your cells, called interstitial fluid.

HbA1c test As well as regularly testing your own blood sugars, at least once a year your healthcare team will ask you to come in for an HbA1c test. This checks your average blood sugar levels and helps your diabetes team and you spot trends over time. Even slightly high HbA1c levels can lead to serious complications with your eyes, feet, heart and kidneys.

Chapter 6 : Blood sugar testing: Why, when and how - Mayo Clinic

All glucose monitors work in a similar way, but some have features and options that might better suit your specific needs. Recommended Blood Glucose Meters Blood Glucose Meters Ratings.

All therapy adjustments should be based on measurements obtained from standard blood glucose monitoring devices and not on values provided by the system. Individual results may vary. Sensor calibrated every 12 hours; within 30 minutes of event, both Low Threshold and Low Predictive alerts ON; with Based on sensor glucose. The system requires a prescription. Do not calibrate your CGM device or calculate a bolus using a blood glucose meter result taken from an alternative site palm or from a control solution test. It is not recommended to calibrate your CGM device when sensor or blood glucose values are changing rapidly, e. Therefore this device should not be used in anyone under the age of 7 years old. This device should also not be used in patients who require less than a total daily insulin dose of 8 units per day because the device requires a minimum of 8 units per day to operate safely. Pump therapy is not recommended for people whose vision or hearing does not allow recognition of pump signals and alarms. Pump therapy is not recommended for people who are unwilling or unable to maintain contact with their healthcare professional. For complete details of the system, including product and important safety information such as indications, contraindications, warnings and precautions associated with system and its components, please consult [http:](http://) This information is intended to supplement, not replace, blood glucose information obtained using standard home glucose monitoring devices. The information may allow identification of patterns of glucose-level excursions above and below a desired range, facilitating therapy adjustments, which may minimize these excursions. The system is intended to complement, not replace, information obtained from standard blood glucose monitoring devices, and is not recommended for people who are unwilling or unable to perform a minimum of two meter blood glucose tests per day, or for people who are unable or unwilling to maintain contact with their healthcare professional. The system requires a functioning mobile electronic device with correct settings. If the mobile device is not set up or used correctly, you may not receive sensor glucose information or alerts. For complete details of the system and its components, including warnings, contraindications, and precautions, please consult the user guide at [http:](http://) Medtronic, Medtronic logo and Further, Together are trademarks of Medtronic. Third party brands are trademarks of their respective owners. All other brands are trademarks of a Medtronic company.

Chapter 7 : Continuous Glucose Monitoring | NIDDK

You can test your blood sugar at home with a portable electronic device (glucose meter) that measures sugar level in a small drop of your blood. Why test your blood sugar Blood sugar testing “ or self-monitoring blood glucose “ provides useful information for diabetes management.

Sharing Insulin Pens Jeopardizes Patients [3: In the last 10 years, alone, there have been at least 15 outbreaks of HBV infection associated with providers failing to follow basic principles of infection control when assisting with blood glucose monitoring. Due to under-reporting and under recognition of acute infection, the number of outbreaks due to unsafe diabetes care practices identified to date are likely an underestimate. For example, at a health fair in New Mexico in , dozens of attendees were potentially exposed to bloodborne viruses when fingerstick devices were inappropriately reused for multiple persons to conduct diabetes screening. Additionally, at a hospital in Texas in , more than 2, persons were notified and recommended to undergo testing for bloodborne viruses after individual insulin pens were used for multiple persons. Unsafe practices during assisted monitoring of blood glucose and insulin administration that have contributed to transmission of HBV or have put persons at risk for infection include: Protection from bloodborne viruses and other infections is a basic requirement and expectation anywhere healthcare is provided. Top of Page

Fingerstick Devices Fingerstick devices, also called lancing devices, are devices that are used to prick the skin and obtain drops of blood for testing. There are two main types of fingerstick devices: These devices often resemble a pen and have the means to remove and replace the lancet after each use, allowing the device to be used more than once. Some of these devices have been previously approved and marketed for multi-patient use, and require the lancet and disposable components platforms or endcaps to be changed between each patient. However, due to failures to change the disposable components, difficulties with cleaning and disinfection after use, and their link to multiple HBV infection outbreaks, CDC recommends that these devices never be used for more than one person. If these devices are used, it should only be by individual persons using these devices for self-monitoring of blood glucose. Single-use, auto-disabling fingerstick devices: These are devices that are disposable and prevent reuse through an auto-disabling feature. In settings where assisted monitoring of blood glucose is performed, single-use, auto-disabling fingerstick devices should be used. Blood Glucose Meters Blood glucose meters are devices that measure blood glucose levels. Whenever possible, blood glucose meters should be assigned to an individual person and not be shared. If the manufacturer does not specify how the device should be cleaned and disinfected then it should not be shared. A simple rule for safe care: If shared, blood glucose meters should be cleaned and disinfected after every use. They should never be used for more than one person. Select single-use lancets that permanently retract upon puncture. This adds an extra layer of safety for the patient and the provider. Dispose of used lancets at the point of use in an approved sharps container. Blood Glucose Meters Whenever possible, blood glucose meters should be assigned to an individual person and not be shared. General Unused supplies and medications should be maintained in clean areas separate from used supplies and equipment e. Do not carry supplies and medications in pockets. Insulin Administration Insulin pens should be assigned to individual persons and labeled appropriately. Multiple-dose vials of insulin should be dedicated to a single person whenever possible. If the vial must be used for more than one person it should be stored and prepared in a dedicated medication preparation area outside of the patient care environment and away from potentially contaminated equipment Medication vials should always be entered with a new needle and new syringe Dispose of used injection equipment at point of use in an approved sharps container. Never reuse needles or syringes. Hand Hygiene Hand washing with soap and water or use of an alcohol-based hand rub Wear gloves during blood glucose monitoring and during any other procedure that involves potential exposure to blood or body fluids. Change gloves between patient contacts. Change gloves that have touched potentially blood-contaminated objects or fingerstick wounds before touching clean surfaces. Discard gloves in appropriate receptacles. Perform hand hygiene immediately after removal of gloves and before touching other medical supplies intended for use on other persons. Provide a full hepatitis B vaccination series to all previously unvaccinated staff persons whose

activities involve contact with blood or body fluids. Establish responsibility for oversight of infection control activities. Provide staff members who assume responsibilities for fingersticks and injections with infection control training. Assess adherence to infection control recommendations for blood glucose monitoring and insulin administration by periodically observing staff who perform or assist with these procedures and tracking use of supplies. Report to public health authorities any suspected instances of a newly acquired bloodborne infection, such as hepatitis B, in a patient, facility resident, or staff member. Check with state authorities for specific state and federal regulations regarding laboratory testing. Top of Page Additional Information For additional information on assuring safe care during blood glucose monitoring and insulin administration, consult the following resources.

Chapter 8 : Blood glucose monitoring - Wikipedia

Continuous Glucose Monitoring (CGM) is a method to track glucose levels throughout the day and night. CGM systems take glucose measurements at regular intervals, 24 hours a day, and translate the readings into dynamic data, generating glucose direction and rate of change reports.

Managing diabetes is one part investigation and two parts action. Unlike some other diseases that rely primarily on professional medical treatment, diabetes treatment requires active participation by the person who has it. Monitoring your blood sugar level on a regular basis and analyzing the results is believed by many to be a crucial part of the treatment equation. When someone is first diagnosed with diabetes, he is usually given a blood sugar meter or told to go buy one and told how and when to use it, as well as what numbers to shoot for. However, the advice a person receives on when to monitor and what the results should be generally depend on his type of diabetes, age, and state of overall health. At least three major health organizations have published slightly different recommendations regarding goals for blood sugar levels. Advertisement There is some common ground when it comes to blood sugar monitoring practices. For example, most people take a fasting reading before breakfast every morning. Some people also monitor before lunch, dinner, and bedtime; some monitor after each meal; and some monitor both before and after all meals. However, when monitoring after meals, some people do it two hours after the first bite of the meal, while others prefer to check one hour after the start of a meal. To help sort out the whys and when of monitoring, three diabetes experts weigh in with their opinions. Regular monitoring is critical in diabetes care. Self-monitoring is an integral part of diabetes management because it puts you in charge. Regardless of how you manage your diabetes – through diet and exercise alone or combined with oral medicines or insulin – regular blood sugar monitoring provides immediate feedback on how your program is working. For example, if you take insulin and your blood sugar is high, you may need to bolus, or take more rapid-acting insulin, to bring your levels down into range. If you manage your Type 2 diabetes with diet and exercise, you might treat high blood sugar with a walk around the block. People who use insulin and certain oral diabetes drugs are also at risk of developing low blood sugar, or hypoglycemia, which needs to be treated promptly when it occurs. Regular monitoring may enable you to catch and treat it early, and any symptoms of hypoglycemia should be checked with a meter reading. Over time, blood sugar monitoring records can be analyzed for patterns of highs or lows that may suggest that a change is needed in the treatment regimen. That will definitely boost your motivation. At least some studies have found that the more often people monitor their blood sugar with a conventional blood sugar meter, the better their glycosylated hemoglobin HbA1c levels. The HbA1c test is a measure of blood sugar control over the previous two to three months. Other studies have reported similar benefits for continuous monitoring, in which a sensor worn under the skin transmits glucose measurements every few minutes to a receiver. The GuardControl Trial, for example, found that participants with Type 1 diabetes who used a continuous glucose monitor for three months experienced a 1-percentage-point drop in their HbA1c levels. A person whose Type 1 diabetes is in stable control should monitor a minimum of four times a day. For people whose Type 2 diabetes is in good control, Dr. Ganda recommends monitoring twice a day. But, he notes, the majority of his patients with Type 2 diabetes are not in good control and should check more often. In some cases, insurance companies will cover more strips if a doctor writes a prescription for more, and some people choose to buy more strips on their own, out of pocket. In the study, participants were split into three groups: A control group had their HbA1c levels measured every three months but was not asked to use a blood sugar meter unless their doctor considered it essential to their management. A less-intensive group was asked to record three blood sugar values daily on two days during the week one fasting reading and the other two readings before meals or two hours after meals. Participants were also given blood sugar goals for before and after meals and advised to consider contacting their doctor if their readings were consistently high or low. A more-intensive group was also told to monitor their blood sugar levels at home and was given training and support in timing, interpreting, and using the results of their blood sugar checks. At the end of the year, both home-monitoring groups saw a slight reduction in HbA1c levels. However, the researchers note the results were statistically

insignificant. By the end of the study, roughly half of the participants were monitoring less than twice a week. For home monitoring to help you reach your goals, you need to check more frequently, analyze the data, and make changes as necessary. If your readings are consistently higher than these goals, it may be because of the dawn phenomenon or a result of the Somogyi effect. In the dawn phenomenon, hormones released in the very early morning cause increased insulin resistance, resulting in higher blood sugar levels. This occurs in everyone, with diabetes or without. Common preventive treatments for high morning blood sugar caused by the dawn phenomenon include getting daily exercise, eating a carbohydrate-containing bedtime snack, or adding the drug metformin brand name Glucophage and others to the diabetes control regimen. The Somogyi effect, which is more likely to occur in people who use insulin, is a phenomenon in which low blood sugar during the night causes the body to release hormones that raise blood sugar levels, resulting in high morning levels. People who are experiencing high morning blood sugar levels are often encouraged to wake up at 3 AM on several occasions to check their blood sugar. High blood sugar at this time may point to the dawn phenomenon as the cause of the high morning readings, while low blood sugar at 3 AM may suggest the Somogyi effect. Checking before meals Similar to fasting readings, monitoring your blood sugar before meals gives you a baseline reading of your blood sugar before you eat. Some medical professionals call these preprandial readings. Basu says that monitoring after meals is not necessary. Until more data prove that postmeal values are important, I find it hard to recommend postmeal monitoring. Ganda agrees that premeal monitoring is a critical tool in diabetes management but says that sometimes postmeal readings are needed. For people who choose to monitor after meals, the clock for when to check starts counting down at the start of the meal. Some people with diabetes monitor one hour after the start of meals in an effort to find their peak blood sugar level, then work to prevent spikes above certain levels. The after-meal blood sugar goals for nonpregnant adults published by major diabetes organizations currently specify levels two hours after the start of meals. With diabetes, you peak a little later, and two hours is the standardized amount of time for blood sugar to come back down. It may be the peak at one hour, or the peak may not have occurred yet. Every person is different. Most of the research we have is based on HbA1c numbers, not postmeal readings. But, in my experience, to get an HbA1c result below 6. Dale, the diabetes educator from the University of Michigan, suggests a shift in perception that can help avoid knee-jerk reactions to high or low numbers: Was my serving of pasta too large? Do I need to lower my insulin dose before exercise? What can I do better to prevent this from happening in the future?

Chapter 9 : Blood glucose meter: How to choose - Mayo Clinic

Continuous glucose monitoring automatically tracks blood glucose levels, also called blood sugar, throughout the day and night. You can see your glucose level anytime at a glance. You can see your glucose level anytime at a glance.

Sign up now Blood glucose meter: How to choose Many types of blood glucose meters are available. Exercise, food, medications, stress and other factors affect your blood glucose level. Using a blood glucose meter can help you better manage your diabetes by tracking any fluctuations in your blood glucose level. Many types of blood glucose meters are available, from basic models to more-advanced meters with multiple features and options. The cost of blood glucose meters and test strips varies, as does insurance coverage. Study your options before deciding which model to buy. Choosing the right meter When selecting a blood glucose meter, it can help to know the basics of how they work. To use most blood glucose meters, you first insert a test strip into the device. Then you prick a clean fingertip with a special needle lancet to get a drop of blood. You carefully touch the test strip to the blood and wait for a blood glucose reading to appear on the screen. When used and stored properly, blood glucose meters are generally accurate in how they measure glucose. They differ in the type and number of features they offer. Here are several factors to consider when choosing a blood glucose meter: Check with your insurance provider for coverage details. Some insurance providers limit coverage to specific models or limit the total number of test strips allowed. Meters vary in price. Be sure to factor in the cost of test strips. Ease of use and maintenance. Some meters are easier to use than others. Are both the meter and test strips comfortable and easy to hold? Can you easily see the numbers on the screen? How easy is it to get blood onto the strips? How big a drop of blood is required? Ask about the features to see what meets your specific needs. Special features may include large, easy-to-handle buttons and test strips, illuminated screens, and audio, which may be useful for people with impaired vision. Information storage and retrieval. Consider how the meter stores and retrieves information. Some meters offer the ability to download your blood glucose readings to a computer or mobile device, then email the test results to your doctor. Many meter manufacturers include a toll-free number that you can call for help. Look for a meter that includes clear instructions that demonstrate the correct way to use the meter. Some manufacturers offer user manuals on their websites. Advances in monitoring tools Although finger pricks remain the gold standard for blood sugar monitoring, researchers are developing products designed to take the "ouch" out of the process. Ask your doctor about these alternatives.