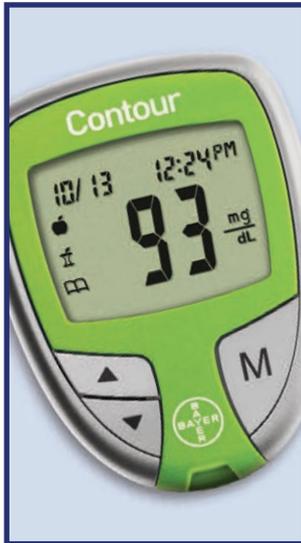


*“My Doctor Says  
I Should Monitor My Blood Glucose...”*

## What Does This Mean?



Helping all people  
live healthy lives

**BD Getting Started™**

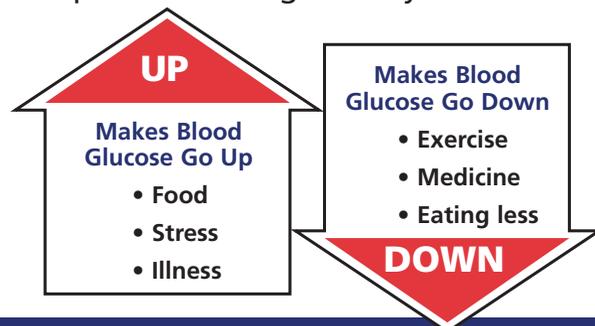
**Self-Monitoring of Blood Glucose**

## Daily Blood Sugar Monitoring

When you have diabetes, managing your blood glucose level is the most important thing you can do to feel your best and prevent long-term complications. Blood glucose monitoring (BGM) is a way for you to take charge of your health by checking your blood glucose with a blood glucose meter.

### Checking at home or "on the go"

Managing your diabetes is a combination of healthy eating, being active, and, if needed, taking medications. You can play a big role in managing your diabetes by monitoring (checking) your own blood glucose levels. The information you get from **checking your blood glucose** helps you to manage your diabetes in the best way possible. **Self-Monitoring** means you check your own blood glucose at home or on the go with a blood glucose meter. Using a blood glucose meter tells you the level of your blood glucose at the moment it is being checked. It also tells you the effect of food or activity that happened one to two hours before the blood glucose was taken. This is important because blood glucose levels are always changing during the day and night. You may not feel these changes until they reach very high or very low levels. Many things can make your blood glucose go up or down. Checking your blood sugar daily is important to keep your blood sugar in target range as much as possible during the day and avoid highs and



lows. Short term (daily) control is key to achieving long term control.

### Checking for long term glucose control in your doctor's office and at home

Since it is difficult for you to check your blood glucose at all times during the day and night, you will need an additional test called A1C to give you and your doctor a more accurate overview of your diabetes management over a longer time period.

#### The A1C (A-one-C) test

This blood test is done at the laboratory or in your doctor's office every 3 to 6 months. It measures the average amount of blood glucose that has been in your blood over the last 3 months. Both day-to-day self-monitoring and periodic A1C monitoring are necessary to keep careful track of your blood glucose control. A1C testing is now available at home. This simple test can help you gauge your progress between visits.

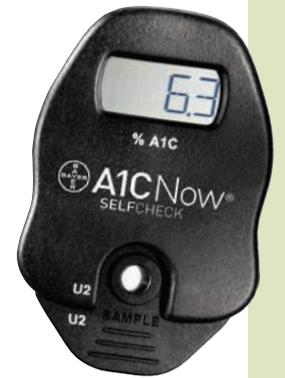
For more information about the A1C test, read the BD brochure, "A1C What's your Number?".

#### eAG (estimated Average Glucose)

This new number is directly related to A1C, but uses the same values and units that you see when you check your blood glucose with a meter or receive a glucose result on a lab report. It is another way to look at diabetes control over a 3 month period of time.

#### What is so important about my average?

Your estimated average glucose is strongly linked to your risk of developing long-term complications of diabetes. The closer your average is to "normal" (around 70-130 mg/dL), the better off you are. Most blood glucose meters tell you your average blood glucose over the past 14 days.



## WHY Do I Need to Check My Blood Glucose?

### Managing your diabetes by setting blood glucose goals

Your doctor will help you set goals, sometimes called **targets**, for your blood glucose levels. These are the ranges of numbers that your blood glucose should fall within most of the time. *Research has shown that keeping your blood glucose as close to your targets as possible can prevent or slow the complications of diabetes.* Although diabetes is a condition that does not go away, it can be managed by healthy eating, being active and, if needed, taking medication.



### How self-monitoring helps you

Checking your own blood glucose gives you the information you need to answer these important questions:

- Is your blood glucose in its target ranges most of the time?
- What is your blood glucose level — too high, too low, or right on target?
- How can I correct an out-of-target blood glucose level?
- Do you need to take action to correct blood glucose that is too high or low?
- What changes can you make in the way you eat, take your medication or increase your activity that may improve your blood glucose readings?

**Note:** If your blood glucose was within target range before your favorite snack and out of range a few hours later, you may decide to eat less, exercise more or give more insulin next time.

- What is causing out-of-target blood glucose? Did you eat too much or skip exercise? Are you sick? Is your medication working properly? Has anything changed in your routine?

### Your tool for better management

When you self-monitor your blood glucose you are checking to see if you are staying within your targets or blood glucose goals. If you are outside your targets, you may need to take action. Think of your results as within your target range, “high or low” rather than “good or bad.” *Blood Glucose Monitoring (BGM) is a useful tool that lets you know if you need to take action or not. It puts you in charge of the things that affect blood glucose control.*

Your doctor or diabetes educator will work with you to decide the blood glucose goals that are right for you. The following table provides recommended target blood glucose ranges and shows when you should take action to get your blood glucose back on track.

#### RECOMMENDED TARGET BLOOD GLUCOSE LEVELS

ADA RECOMMENDED TARGETS FOR BLOOD GLUCOSE CONTROL IN ADULTS WITH DIABETES <sup>1</sup>			
	Normal	Target	When To Take Action
<b>Plasma Glucose</b>			
<b>Before eating</b>	Less than 100	70 to 130	If less than 70 or greater than 130
<b>2 hours after eating</b>	Less than 130	Less than 180	If less than 70 or greater than 200
<b>A1C</b>	Less than 6	Less than 7	If greater than 7

<sup>1</sup> American Diabetes Association. Standards of medical care in diabetes - 2010. *Diabetes Care*. 2010;33(suppl 1):S18

## WHEN Should I Check My Blood Glucose?

### Deciding on your treatment plan

You and your doctor or diabetes educator will decide when you need to check your blood glucose and how often it should be done. This will depend on your treatment plan and how often you are willing to check your blood glucose.



People who manage their diabetes with healthy eating and exercise, have a regular daily routine, and meet their blood glucose goals may only need to test once a day or a few times a week. People who take insulin may need to check four times a day or more.

You may need to check more often as your treatment plan changes or you are sick or feel stressed. When you begin to monitor your blood glucose or if your blood glucose is not well managed, you

may be asked to check your blood glucose

more often than usual.

This will give you and your doctor the information necessary to make changes to your treatment plan.

Once you have reached your blood glucose goals, you may be able to reduce the number of blood glucose checks you do each day.

Bedtime		Night	Comments
time blood glucose	insulin	time blood glucose	
180	15L		ate lunch out
120	15L		
90	15L		ran 30 min. ate larger snack

The following table is designed to help you know when to check your blood glucose.

### GUIDELINES ACCORDING TO TYPE OF DIABETES AND TREATMENT<sup>2</sup>

Type of Diabetes	Treatment	Number Of Checks Per Day
TYPE 1	2 to 3 insulin injections per day	3 or more — usually before giving an injection and always at bedtime
	Pump therapy or 4 insulin injections per day	4 to 8 times a day — usually before and after meals and always at bedtime
	Changing treatment or routine	4 or more — usually before giving an injection and always at bedtime
	During illness	At least every 4 to 6 hours
TYPE 2	2 to 3 insulin injections per day	2 to 3 times — usually before giving an injection and always at bedtime
	Pump therapy or 4 insulin injections per day	4 to 8 times a day — usually before and after meals and always at bedtime
	Changing treatment or routine	3 or more — always at bedtime (Ask your provider or diabetes educator)
	Healthy Eating and Exercise	Ask your provider or diabetes educator — usually exercise once a day

<sup>2</sup> American Diabetes Association. Standards of medical care in diabetes - 2010. *Diabetes Care*. 2010;33(suppl 1):S11-S61.



## A commonly recommended BGM plan

Check blood glucose:

- Before meals and before taking insulin or medication
- Two hours after meals
- Before bedtime

**Note:** For people who may have low blood glucose reactions during the night, a 3:00 AM blood glucose check may also be needed.

## If you are taking insulin

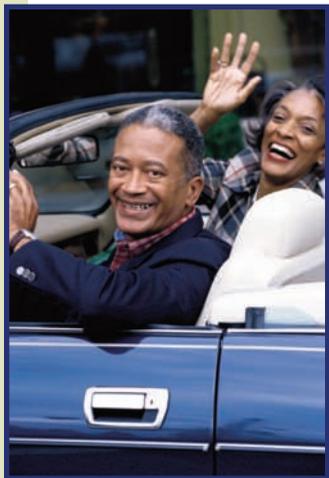
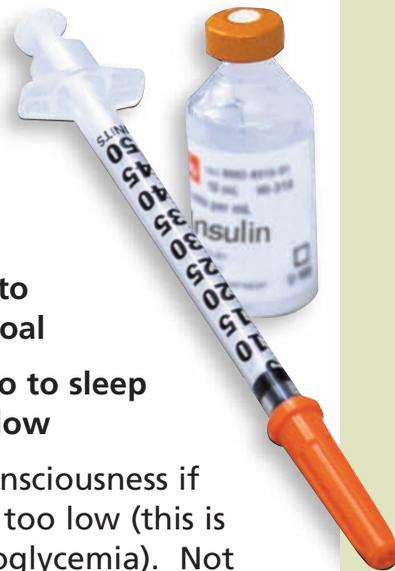
Self-monitoring your blood glucose will let you know if:

- Your food, activity and insulin are matched
- An extra dose of insulin is needed to bring your blood glucose to your goal
- It is safe for you to drive a car or go to sleep because your blood glucose is too low

**Note:** There is a danger of losing consciousness if your blood glucose is too low (this is known as severe hypoglycemia). Not everyone gets warning signs of low blood glucose. BGM is the only sure way to know what your blood glucose level is at any time of day.

### Change-of-routine alert!

No matter what BGM plan you have developed with your health care team, it is recommended that you check your blood glucose **WHENEVER** you have a change in your daily routine.



Examples:

1. **A change in your usual meal plan** (if you eat too much; eat out at a restaurant; attend a special occasion; or are sick and not eating as usual).
2. **Possible low blood glucose reaction** (you are shaky, tired, sweaty, hungry, confused or have a headache).
3. **You are sick.** It is especially important to check your blood glucose when you do not feel well. Blood glucose usually increases when you are sick. It is a good idea to check your blood glucose at least every 4 to 6 hours when you are sick. Calling your doctor or health care provider with your symptoms and blood glucose results can help the doctor decide on the proper treatment for your illness and prevent problems with your diabetes. For more information about sick days, read the BD brochure, **"BD Getting Started™ Sick Days"**.
4. **Possible high blood glucose reaction** (you are thirsty, hungry, urinating more often, have blurred vision, headache or feel tired).
5. **Before, during and/or after exercise.**
6. **You are not feeling well.**
7. **Before driving or driving for long periods of time.**

**Note:** You might also increase the number of times you check your blood glucose each day whenever you and your health care team want to improve your overall blood glucose levels, or any time you want to know your blood glucose level.

## HOW Do I Check My Blood Glucose?

### Find the right meter

Your diabetes educator will help you choose the glucose meter that is best for you, teach you how to use it and how to record the results. Several different meters and supplies are available to help you check your blood glucose levels.

Important features to consider when selecting a blood glucose meter:

- **Fast results**
- **Small blood sample size**
- **Convenient size of meter**
- **Easy-to-read display numbers**
- **Ability to check blood glucose in other places besides finger**
- **Data management (such as tracking date and time of blood glucose results)**
- **Cost of supplies and insurance coverage**
- **Ease of using the meter and strips**
- **Whether or not the meter requires coding**
- **Impact of interfering substances on meter accuracy (ask your Health Care Provider)**



### Steps to follow:

Checking your blood glucose is a simple process using a lancing device, lancet, test strip and a meter. Your diabetes educator will teach you how to do this with the blood glucose meter you have chosen. The following are general instructions for using a blood glucose meter. Check to see if your meter needs to be coded with your strips before using. Not all meters require coding.

### General instructions for using a blood glucose meter:

1. Wash your hands or clean your finger or other site

with alcohol. If you are using alcohol, let it dry before you prick your finger.

2. Prick the site with a lancing device.
3. Put a little drop of blood on a test strip.
4. Follow the instructions that come with your meter for inserting the test strip and using the blood glucose meter.
5. In seconds, the blood glucose meter reads your blood glucose level.



### Supplies you will use:

1. **Blood glucose meter** — reads blood glucose.
2. **Test strip** — collects blood sample.
3. **Lancet or small needle** — fits into lancing device, pricks finger, and provides small drop of blood for glucose strip.
4. **Lancing device** — pricks finger when button is pressed. Most devices have dials to select how deep the needle goes into the skin. Start with middle depth. If you get more blood than needed, dial the number down so the lancet does not go as deep. If you get less blood, dial the number up so lancet goes deeper.
5. **Alcohol wipes or soap and water** — to clean fingers or other testing site.
6. **Control solution** — checks test strip for accuracy. The amount of glucose in the control solution is already known. When placed on a test strip, value should match control solution value on bottle, package of strips or package insert that came with your strips. If the result does not fall into the printed range, this may mean the strip or control solution is expired, damaged, has not been properly stored or has not been correctly calibrated (measured). You should call the company



who makes the meter for instructions if this happens.

- 7. User manual** — provides information about your meter. After reading, place in safe place so that you can find it when you have a question about your meter.
- 8. Warranty card or papers** — complete, make file copy and send in immediately.



### Tips for Proper Use

**Read instructions carefully.** Glucose meters and test strips come with instructions for use. Your user manual should also include a phone number that you can use to contact the manufacturer.

**Use the test strips that are recommended for your glucose meter.** It is important to use only the test strips that are specified for your glucose meter. Otherwise, the device may fail to give results or may give inaccurate results.

**Know the factors that affect meter accuracy.**

These may include:

- The amount of red blood cells (hematocrit) in the blood
- Other substances present in the blood such as uric acid, glutathione, and vitamin C
- Altitude, temperature, and humidity

**Perform quality-control checks.** Use control solutions to ensure that the test strips and meter are working together properly. Some meters may also provide electronic test strips that induce a signal to indicate if the meter (and only the meter) is working correctly. Perform a quality control test each time you begin a new bottle of test strips or when you question the accuracy of the results.

**Ask your health care provider to watch you test yourself.** He or she can tell you if you are using the meter correctly.

**Know when and how to clean your meter.** Some meters need regular cleaning. Others don't need regular cleaning, but contain electronic alerts indicating when you should clean them. You should follow the directions given in the manual on how to clean the meter.

**Understand what the meter display means.** The range of glucose values can be different among meters. Be sure you know how high and low glucose values are displayed on your meter. Sometimes they are displayed as "LO" or "HI" when the glucose level is beyond the range that the meter can measure.

### Alternative site testing

Some blood glucose meters allow you to use blood from "alternative sites" to check your blood glucose. These sites are the upper arm, forearm, base of thumb and thigh. You should be aware that blood glucose values from these sites may be different than the results you will receive from a finger. The body uses the glucose in your blood at different rates so you can test your fingertip and your arm at the same time and get different results. This usually happens when blood glucose is changing quickly, after a meal, after a dose of insulin or during or after exercise.

You should check the blood from your fingers in the following situations:<sup>3</sup>

1. If it has been less than 2 hours after a meal, insulin dose or exercise.
2. If you think your blood glucose is low or you have a condition called **Hypoglycemia Unawareness**. This

<sup>3</sup> U.S. Department of Health & Human Services. FDA resources page. Food and Drug Administration web site. <http://www.fda.gov/ForConsumers/ConsumerUpdates/ucm049051.htm>. Updated May 18, 2009.

happens because you do not have signs of low blood glucose until your blood glucose is very low.

- If the results you receive from the alternative site do not agree with the way you feel.

Use blood samples from sites other than your fingers only for testing before a meal or more than two hours after a meal.

### Troubleshooting tips for you

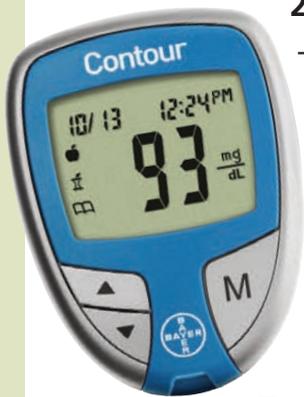
#### 1. Can't get blood out of your finger?

- Place hands under warm water and rub together
- Hang hand down below waist
- Grasp finger near area to be pricked and squeeze gently for three seconds
- Place finger on table or firm surface to avoid moving while pricking
- If lancing device has dial-a-depth, increase setting by 1 level
- Use a new lancet every time you check blood glucose



#### 2. Hurts too much?

- If lancing device has dial-a-depth, decrease setting by 1 level
- Use a new lancet every time you check blood glucose
- Try a thinner lancet or a different lancing device
- Use sides of fingertips instead of fingertip pad
- Try alternative test sites such as arm or thigh
- Ask diabetes educator for suggestions



### 3. Error message?

- Review user manual (error codes and problems are identified in manual)
- Make sure right amount of blood is on strip
- Make sure blood is on correct part of strip
- Call manufacturer's phone number (listed on back of meter or in user manual)
- Ask diabetes educator for suggestions

**Note:** For tips with self-monitoring problems, review your user manual, ask your diabetes educator, or contact your meter's manufacturer.

## WHAT Should I Do With My Results?

**Write your blood glucose results in a logbook and review with your health care team, or download or print your results from your diabetes management software**

Also record:

- Date and time of test
- Insulin dose or diabetes medicine
- Whether you ate more or less than usual
- If you did any exercise
- Add comments such as "had a headache, didn't feel well, or felt great, etc."

Keeping these records and going over them with your doctor or diabetes educator will help you notice patterns

	Breakfast			Lunch			Dinner			Bedtime		Night	Comments
	before	insulin	after	before	insulin	after	before	insulin	after	time	insulin	time	
Day date	time blood glucose		time blood glucose										
Mon 04/29	106	5%		100	6%		240	8%		180	15L		ate lunch out
Tue 04/30		5%	140		6%	180		8%		120	15L		
Wed 05/01	115	5%		130	6%		180	8%		90	15L		ran 30 min. ate larger snack

	Breakfast			Lunch			Dinner			Bedtime		Night	Comments
	before	insulin	after	before	insulin	after	before	insulin	after	time blood glucose	insulin	time blood glucose	
Day date	time blood glucose		time blood glucose	time blood glucose		time blood glucose	time blood glucose		time blood glucose	time blood glucose		time blood glucose	Diet, exercise, ketones, stress, feelings, general health
Mon 04/29	69	5k		68	6k		68	8k		180	15L		Nausea, Vomiting
Tue 04/30		5k	140		6k	180		8k		120	15L		ate lunch out
Wed 05/01	115	5k		130	6k		180	8k		90	15L		

that may occur and will lead to a better understanding of how food, exercise, stress, medications, and other events in your life may affect your blood glucose. When you look at the record of your blood glucose results over a period of days, you and your doctor may be able to identify what may have caused the readings you see.

You should not be worried about one blood glucose that is out of range, but if there are a number of them that do not fall into range, then you need to look for a pattern. You want to see if the blood glucoses seem to be high or low at the same time of day for a number of days. If you detect such a pattern, you need to think about the activities that may have affected that blood glucose result. You will then be able to make an informed decision about what you can do to improve your blood glucose.

For more information about using “blood glucose patterns” refer to **BD Staying on Target™ Pattern Management** brochure at [www.bddiabetes.com](http://www.bddiabetes.com).

### Ask your doctor or health care provider for specific telephone guidelines

You need to know:

1. When to call his or her office to report routine blood glucose results.
2. When to call about high or low blood glucose. For example, your doctor may want you to report the following information:
  - A severe low blood glucose that requires treatment by another person

- Blood glucose consistently running below 70 to 80 more than 2 to 3 times in a row
- More than one unexplained low blood glucose reaction in a week
- Blood glucose consistently higher than 300 (more than 2 to 3 days)
- If you are ill with nausea, vomiting, diarrhea or fever



## HOW Long Do I Need To Monitor My Blood Glucose?

Diabetes is a chronic condition that does not go away. BGM is a skill that you will always need to make sure that your diabetes is well managed. It gives you the information you and your doctor need to make decisions about your treatment and daily activities in life.

### Living a healthy life with diabetes

Your diabetes educator will design a treatment plan with you that is personalized for your needs (see last page). Self-monitoring your blood glucose as recommended by your health care team will allow you to:

- See if your diabetes treatment plan is working
- Build the new habits necessary to help you manage your diabetes
- Live well with the condition

BD provides this brochure for informational purposes only. It is not intended to be a substitute for professional medical advice, diagnosis or treatment. Always seek the advice of your physician or other qualified healthcare provider with any questions you may have regarding a medical condition. Never disregard professional medical advice or delay in seeking it because of something you have read in this brochure.

**TREATMENT PLAN FOR:** \_\_\_\_\_

**Health care team:**

Doctor: \_\_\_\_\_

Nurse Educator: \_\_\_\_\_

24 hr. Emergency Telephone: \_\_\_\_\_

Fax Blood Glucose Records to: \_\_\_\_\_

Email Blood Glucose Records to: \_\_\_\_\_

Send Blood Glucose Records to: \_\_\_\_\_

**My target blood glucose ranges are:**

Before a meal: \_\_\_\_\_ mg/dl.

2 hours after a meal: \_\_\_\_\_ mg/dl.

Just before bedtime: \_\_\_\_\_ mg/dl.

At 3:00 AM: \_\_\_\_\_ mg/dl.

**My A1C (Average Blood Glucose) Goal is:** \_\_\_\_\_ mg/dl.

**Self-monitoring — My blood glucose levels should be checked at the following times:**

Fasting (before breakfast): \_\_\_\_\_

Two hours after breakfast: \_\_\_\_\_

Before lunch: \_\_\_\_\_

Two hours after lunch: \_\_\_\_\_

Before dinner: \_\_\_\_\_

Bedtime: \_\_\_\_\_

3:00 AM: \_\_\_\_\_

**I WILL CONTACT MY DOCTOR OR HEALTHCARE TEAM IF:**

1. My blood glucose is more than \_\_\_\_\_ mg/dl for \_\_\_\_\_ readings.

2. I experience \_\_\_\_\_ episodes of unexplained low blood glucose (less than \_\_\_\_\_) in one week.

3. \_\_\_\_\_

\_\_\_\_\_

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