



BLOOD GLUCOSE

MONITORING AND DATA MANAGEMENT SYSTEMS

Before you buy a blood glucose monitor (also known as a blood glucose meter), check with your doctor and diabetes educator. Make sure the one you choose is well suited to your particular needs. You might want to have one at home and one for use at school or the office.

HEALTH CARE PROVIDERS agree that blood glucose monitors offer substantial benefits to users that other methods do not begin to approach. Although urine testing is important for checking ketones, urine testing for glucose is no longer considered to be an adequate tool for monitoring.

To help you in your hunt to find the best monitor for you, here are a few things to look for:

Expense. The cost of a blood glucose monitor and diabetes care supplies is often covered by health insurance. But don't just assume your insurance will reimburse you. Find out what your insurance company covers and get approval before you buy. Some insurance companies and health care systems have special arrangements for certain monitors or systems. If you have an established health care team, you should discuss choices and cost with them before you buy.

You can usually find a deal on monitor trade-ins with rebates and special purchase offers. Check with your doctor

and diabetes educator. Keep an eye on ads and compare prices before you buy.

In addition to the cost of a monitor, check the cost of testing supplies that you will need for that monitor. (Using the test strips or sensors, control solution, and other supplies over time often adds up to be more costly than the monitor itself.) These added costs may influence your decision more than the cost of the monitor. You should always check with your insurance company before buying. Some insurers will only pay for certain strips. If the strips are not covered, you'll need to assess the costs and benefits. You should also discuss with your health care professional how many times you should check your blood each day and what your budget can cover. Although you do not need a prescription to purchase strips, you may need one to get insurance reimbursement (co-pay).

Ease of use. Some monitors are easier to use than others. Some require a smaller drop of blood than others. Some require fewer steps to operate, and some take less

time than others. If possible, talk with others who use monitors before you make your purchase to find out the pluses and minuses of various models. Remember that most monitor manufacturers have toll-free numbers for customer questions. Your health care team may be familiar with several different types, so check with them. Also, make sure your doctor will be able to work with the machine you choose. If you buy a monitor your doctor or diabetes educator is unfamiliar with or does not recommend, you may wind up not using it to its maximum potential.

Accuracy. All monitors currently on the market have a fairly high degree of accuracy if used properly. The monitor may become less accurate over time, so it is important to test your glucose monitor to ensure it is providing an accurate reading. Test monitor accuracy at least once a month (or according to manufacturer's instructions), or anytime you suspect a problem—for example, when strips are stored in unusual conditions during travel.

One way to test your monitor's accuracy is to check your blood glucose on your monitor at the same time you are having blood drawn from your vein at your next doctor visit. The two samples should be taken within a minute or two of each other to get the most accurate comparison.

Blood glucose levels measured by a monitor use capillary blood directly from fingersticks. In contrast, blood glucose drawn from a vein by your doctor is sent to a laboratory, which spins blood cells out



Pairing Your Monitor With Software

Here is a list of blood glucose monitors that interact with computer software, as well as company Web sites and customer service numbers.

**Abbott Laboratories
Abbott Diabetes Care**
Monitors: Precision Xtra, FreeStyle, Freestyle Flash, FreeStyle Freedom
www.abbottdiabetescare.com
1-888-522-5226

Arkray
Monitors: Advance Micro-draw, QuickTek
www.arkrayusa.com
1-800-818-8877

**Bayer HealthCare, LLC
Bayer Products**
Monitors: Ascensia Breeze, Contour
www.bayerdiabetes.com
1-800-348-8100

BD
Monitors: BD Logic BGM
www.bddiabetes.com
1-888-232-2737

Bionime
Monitors: Bionime Rightest GM300
www.bionime.com
+866-4-2495-1268

Home Diagnostics, Inc.
Monitors: Prestige IQ, TrueTrack Smart System,
www.homediagnostics.com
1-800-342-7226

LifeScan
Monitors: OneTouch (Basic, Ultra, Ultra 2, UltraSmart, SureStep)
www.lifescan.com
1-800-227-8862

Roche Diagnostics
Monitors: Accu-Chek (Active, Aviva, Compact Plus, Advantage)
www.accu-chek.com
1-800-858-8072

of the sample, leaving only plasma. Glucose is more concentrated in blood plasma than whole blood—roughly 15 percent higher. But virtually all new monitors and test strips are calibrated to yield a plasma glucose value, so these different methods shouldn't influence the results.

Check your box of strips to see if they give a plasma reading.

Assuming they do, readings from these strips and monitors should correspond closely (within 15 percent) to lab readings taken at the same time. If you are not sure how to interpret the readings, check with your doctor or educator.

If your readings are outside of this margin, something is wrong. Poor readings can occur if your

glucose monitor is dirty, old, or stored at extremes of temperature or humidity; if strips are outdated; or if there is a problem in your testing technique. Also, your monitor may not be calibrated to the lot of strips you are using. Be sure you know how and when to calibrate or code your particular model.

Coding. Meter accuracy can also be affected if the meter isn't coded properly. Some studies have shown that readings can be off by as much as 43 percent with certain miscoded meters. If your meter requires a

code strip, code chip, or requires you to input code numbers into the meter, make sure you follow the proper coding process every time you use a new box of strips.

Cleaning and maintenance. No monitor is indestructible; each kind needs proper care. However, some need more cleaning and maintenance than others, which is another option to consider. Once you do buy a monitor, follow the manufacturer's instructions on the proper care for your monitor. Make sure training on the equipment is available nearby. Training that you

can't take advantage of is of no practical use to you.

Portability. All of today's monitors are lightweight and run on batteries, so they are all extremely portable.

Test time. All the monitors provide fast results, usually in less than a minute. Some of the newer monitors even give blood glucose results in five seconds. So speed of results is unlikely to be a major issue in your buying decision. If it is, however, compare the speeds of different monitors.

Audio monitors. If you have a visual impairment, you can still do your own blood glucose monitoring. There are several blood glucose monitors on the market that give verbal instructions to guide a person through the entire testing procedure and give verbal test results.

In the "Aids for People Who Are Visually or Physically Impaired" section of this guide, you will find a couple of "talking" products that announce, audibly, the results calculated by certain monitors (page RG34). Units that "speak" Spanish and other languages are included.

Because technique is important in getting accurate results, you should work through the procedures for several different models to find one that's easy and comfortable for you to use.

Test site. Alternative test site or forearm capillary blood glucose monitoring recently has been touted as a less painful means of checking blood glucose than traditional fingerstick methods. Studies have shown good correlation between fingerstick and forearm methods in people who are fasting. But fingerstick readings do tend to be higher than forearm blood glucose readings after meals. This

Continuous Glucose Monitors

A new generation of blood glucose sensors, known as continuous glucose monitors, promises to change the way patients manage their diabetes. Several products have been approved by the U.S. Food and Drug Administration over the last year and a half (see following page), and they generally are being rolled out incrementally, city by city, across the country.

Unlike traditional monitors that provide one-time snapshots of your blood glucose, continuous glucose monitors deliver readings every few minutes around the clock. This enables patients and their physicians to constantly measure trends, chart ups and downs, and identify problems and make adjustments to insulin, meal, or exercise regimens.

The monitors have alert systems to let you know if your blood glucose is on the way up or down. Safety guards also alert you to hypoglycemia (dangerously low glucose levels) and to hyperglycemia (dangerously high glucose levels).

Although each product is different, all continuous glucose monitors work in a similar way. The skin still must be pricked; non-invasive monitors are in development, but the technology is being refined. For now, a small, disposable sensor is inserted "subcutaneously," which means it is inserted under the skin through a tiny flexible probe. This sensor measures changes in glucose levels in the interstitial fluid (fluid around the cells), and sends the information to a beeper-sized box, which stores the results. Three or four days' worth of data can be stored at a time.

Both type 1 and type 2 patients can use these monitors, although experts say that because the technology is so new, patients should double-check results with a fingerstick reading before treating a high or low.

Talk with your doctor about the availability of these products and whether a continuous glucose monitor makes sense for you.

may be due to less vigorous blood flow in the forearm. Some studies have shown a difference in readings taken from a finger versus the forearm when blood glucose is low. Check with your doctor or educator. It may be safer to do a finger check if you feel the symptoms of low blood glucose coming on. Some studies, however, have shown good correlation between finger and forearm blood glucose levels when the forearm is rubbed or tapped before blood is taken.

The decision to buy a blood glucose monitor is a good one. The determination to use one regularly is even more important. So take the time to find the monitor that best

meets your needs, one that you'll put to regular use.

A note on record keeping. Keeping records is almost as important as blood glucose monitoring itself. Keep a written log of blood glucose test results, even if your monitor has a memory, and take your log book to each appointment. (Your health care team can provide log books.) Be sure to also record other important factors such as eating, activity, and timing.

Data Management Systems

The introduction of blood glucose monitors more than 20 years ago proved to be a boon in helping

people take control of their diabetes. Data management systems can now make the job of tracking your diabetes care even easier.

Data management systems automatically record various aspects of your diabetes control each time you check your blood glucose. Data management systems can store hundreds of test results and other information (depending on the system) such as your glucose levels, the time and date you checked them, insulin types and doses, meals, and a log of your exercises.

If your doctor has a personal computer that is compatible with

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CONTINUOUS GLUCOSE MONITORING SYSTEMS

Product Name (Manufacturer/Distributor)	Components	Description
DexCom STS Continuous Blood Glucose Monitor (DexCom)	Sensor, wireless transmitter, receiver	The DexCom STS consists of a small, wire-like sensor that continuously measures glucose levels, which are transmitted wirelessly to the STS receiver. The sensor is inserted just under the skin by the user and can be worn for up to 3 days before it needs to be replaced. Receiver displays glucose measurements averaged every 5 minutes, as well as 1-, 3-, and 9-hour trends. It also alerts the user of high or low levels. Can be used intermittently. Calibrated using the OneTouch Ultra blood glucose monitor.
GlucoWatch G2 Biographer (Animas Corporation)	Watch (transmitter/receiver), autosensor attaches to watch	Glucose monitoring device that is worn on the forearm. Glucose readings are taken non-invasively through the skin. Provides readings as frequently as every 10 minutes for up to 13 hours at a time and is intended to track glucose patterns and trends. Alarms alert user to low blood glucose, high blood glucose, and rapid trending patterns. Designed to supplement, not replace, conventional blood glucose monitoring. Starter kit, available by prescription only, includes the device, instructional video, user guide, battery charger, two rechargeable batteries, and other accessories. The AutoSensor, a single-use component that provides readings for up to 13 hours, is sold separately.
Guardian RT Glucose Monitoring System (Medtronic Diabetes)	Sensor, wireless transmitter, monitor	The Guardian RT consists of three components: sensor, wireless transmitter, and monitor. Glucose readings are taken every 10 seconds and averaged every 5 minutes—24 hours a day (288 times per day); viewable at the push of a button. Data of past 8 hours can be viewed in 5- or 30-minute increments. Memory holds 21 days of data, which is downloadable to a PC. Alarms warn user of low and high blood glucose levels. Comes with Sen-Serter, an automatic insertion device.

BLOOD GLUCOSE MONITORS AND DATA MANAGEMENT SYSTEMS

Name (Manufacturer/Distributor)	Size (inches)	Weight (ounces)	Test Strip Used*	Range (mg/dl)	Test Time	Battery
Accu-Chek Active (Roche Diagnostics)	4.6 × 1.07 × 0.9	2.01 without batteries	Accu-Chek Active	10–600	5 sec.	(1) 3-volt
Accu-Chek Advantage (Roche Diagnostics)	3.3 × 2.8 × 0.8	1.8 without batteries	Accu-Chek Comfort Curve	10–600	26 sec.	(1) 3-volt coin cell #2032
Accu-Chek Aviva (Roche Diagnostics)	3.7 × 2.0 × 0.86	2.11 with battery	Accu-Chek Aviva	10–600	5 sec.	(1) 3-volt
Accu-Chek Compact Plus (Roche Diagnostics)	4.4 × 1.9 × 1.2 (without lancet device)	4.2 with batteries and test drum (without lancet device)	Accu-Chek Compact	10–600	5 sec.	(2) AAA
Accu-Chek Voicemate (Roche Diagnostics)	6.5 × 3.0 × 2.4	10.94 without batteries	Accu-Chek Comfort Curve	10–600	26 sec.	9-volt for the voice synthesizer; (2) 3-volt in meter
Advance Intuition (Arkray)	3.9 × 2.3 × 0.8	2.2	Advance Intuition	30–550	10 sec.	3-volt (CR 2032)
Advance Micro-draw (Arkray)	3.0 × 2.5 × 0.5	1.5	Advance Micro-draw	20–600	15 sec.	3-volt (CR 2032)
AgaMatrix Wave 1 (AgaMatrix Inc.)	2.8 × 1.6 × 0.6	1.56	Liberty	20–600	Variable; 3–4 sec.	(2) 3-volt lithium
Ascensia Breeze Blood Glucose Monitoring System (Bayer HealthCare, LLC, Diabetes Care Division)	2.5 × 4.1 × 1.0	3.8	Ascensia Autodisc; 10 test strips in one disc	10–600	30 sec.	(1) 3-volt lithium

*These are test strips approved by the manufacturers. In some cases, manufacturers cannot guarantee results or provide assistance if any other test strips are used.

	Warranty	How Calibrated	Control Solution	Features
	3 years	Snap-in code key	Yes	Two-step procedure. Monitor turns on automatically when strip is inserted. Alternate site testing; results are downloadable; small sample size; 7- and 14-day averaging. Rubber grips. English and Spanish instructions including a "First Time Guide." Toll-free call center 24 hours a day, 7 days a week, with multilingual reps.
	3 years	Snap-in code key	Yes	Uses small sample size, capillary action, and large target area for easy dosing. Results are downloadable; 480-value memory with time and date; 7-, 14-, and 30-day averaging. Rubber grips. English and Spanish instructions including a "First Time Guide." Toll-free call center 24 hours a day, 7 days a week, with multilingual reps.
	3 years	Snap-in code key	Yes	Wide-mouth dosing area attracts and holds blood sample allowing patients to fill the strip easily. Large, wide strip and rubber monitor grips provide easy handling. Alternate site testing; results are downloadable; 500-value memory with time and date; 0.6-microliter sample size; 7-, 14-, and 30-day averaging. English and Spanish instructions including a "First Time Guide." Toll-free call center 24 hours a day, 7 days a week, with multilingual reps.
	3 years	No coding required	Yes	Detachable Accu-Chek Softclix Plus lancet device and no strip handling. Underdosed strip detection. Alternate site testing; results are downloadable; 300-value memory with time and date; 1.5-microliter sample size; 7-, 14-, and 30-day averaging. English and Spanish instructions including a "First Time Guide." Toll-free call center 24 hours a day, 7 days a week, with multilingual reps.
	3 years	Snap-in code key	Yes	For the blind and visually impaired. Step-by-step voice guide. Touchable strips. Portable. No cleaning required. Lilly brand insulin identification ensures customer of correct insulin formulation. English and Spanish instructions including a "First Time Guide." Toll-free call center with multilingual reps.
	5 years	Code chip	Yes	Two-step testing. Automatic on/off with strip insertion. 3-microliter sample size. One-button memory recall. Stores up to 10 tests. Large display screen. Guide-Me-Curve strips guide the finger to application site where blood is wicked onto test strip. 10-second test time.
	5 years	Code chip	Yes	Test strips wick the blood onto the end of the strip. 1.5-microliter sample size. Digital display, 250-test memory with time and date stamp. 14- and 30-day average and downloading capabilities with GlucoBalance data management software. Finger or palm testing.
	N/A	Code	Yes, 2 levels	WaveSense glucose monitoring technology makes monitor highly accurate. Variable test time; 3–4 seconds; less painful testing with 0.5-microliter sample (see blood enter strip). Large rubber grips. Monitor activates automatically after strip insertion. Mealtime and 14-, 30-, and 90-day averages/graphs on large, backlit display. Six alarms, including hypo/hyperglycemic alerts.
	5 years	Automatic	Yes	Disc-based monitor; no coding. Underfill detection. Each function button does only one thing. Eliminates individual strip handling and performs 10 tests without reloading. Test strip automatically draws the amount of blood required. Downloadable memory for PC tracking. Stores up to 100 results. Alternate site testing. No cleaning necessary.

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BLOOD GLUCOSE MONITORS AND DATA MANAGEMENT SYSTEMS *continued*

Name (Manufacturer/Distributor)	Size (inches)	Weight (ounces)	Test Strip Used*	Range (mg/dl)	Test Time	Battery	
Ascensia Contour Blood Glucose Monitoring System (Bayer HealthCare, LLC, Diabetes Care Division)	2.9 × 2.09 × 0.68	2	Ascensia Contour	10–600	15 sec.	(2) 3-volt lithium	
Assure II (Arkray)	3.9 × 2.3 × 0.8	2.2	Assure II	30–550	30 sec.	3-volt (CR 2032)	
Assure 3 (Arkray)	3.9 × 2.3 × 0.8	2.2	Assure 3	30–550	10 sec.	3-volt (CR 2032)	
BD Logic Blood Glucose Monitor (BD)	3.6 × 2.3 × 0.9	2.65	BD	20–600	5 sec.	#2450 3-volt coin cell	
FreeStyle (Abbott Diabetes Care)	3.8 × 2.0 × 1.0	2.0	FreeStyle	20–500	7 sec. average	(1) CR 2032, 3-volt lithium coin cell	
FreeStyle Flash (Abbott Diabetes Care)	3.0 × 1.6 × 0.8	1.4	FreeStyle	20–500	7 sec. average	(2) CR 2032, 3-volt lithium coin cell	
FreeStyle Freedom (Abbott Diabetes Care)	3.3 × 2.0 × 0.63	1.43	FreeStyle	20–500	5 sec. average	(1) CR 2032, 3-volt lithium coin cell	
OneTouch Basic (LifeScan)	4.3 × 2.6 × 1.2	4.1	OneTouch	0–600	45 sec.	(2) AAA alkaline (home change)	

*These are test strips approved by the manufacturers. In some cases, manufacturers cannot guarantee results or provide assistance if any other test strips are used.

	Warranty	How Calibrated	Control Solution	Features
	5 years	Automatic	Yes	Automatic coding, control marking, temperature control, and underfill detection. Small sample size (0.6 microliters), 240-test memory with time, date, and 14-day average. Easy viewing of sample fill. Alternate site testing. Downloadable with Ascensia WinGlucoFacts data management software.
	5 years	Code chip	Yes	Two-step testing. Automatic on/off with strip insertion. 3-microliter sample size. One-button memory recall. Stores up to 10 tests. Large display screen. Guide-Me-Curve strips guide the finger to application site where blood is wicked onto test strip. Results in 30 seconds.
	5 years	Code chip	Yes	Two-step testing. Automatic on/off with strip insertion. 3-microliter sample size. One-button memory recall. Stores up to 10 tests. Large display screen. Guide-Me-Curve strips guide the finger to application site where blood is wicked onto test strip. 10-second test time.
	3 years	Built-in button	Yes	Small blood sample (0.3 microliters) from BD Ultra-Fine 33 Lancets. Palm, fingertip, and forearm testing. 250-test memory with 7- and 14-day time-specific averaging for adjusting insulin dose based on patterns of blood glucose values. Memory functions allow for recording insulin type and dose of each insulin delivery. Results are downloadable to BD InterActiv software.
	5 years	Built-in button	Yes	Small blood sample (0.3 microliters). Offers various testing sites. Large display. Strip insertion turns monitor on. Sample is pulled into the strip by capillary action. More blood can be added, using the same target area on the strip, for up to 1 minute. 250-test memory with date, time, 14-day average. Data can be downloaded to a PC or managed with FreeStyle Co-Pilot PC data management system.
	5 years	Built-in button	Yes	Up to four programmable daily alarms. Backlight display. Test port light. Small blood sample (0.3 microliters). Offers various testing sites. More blood can be added, using the same target area on the strip, for up to 1 minute. 250-test memory with date, time, 14-day average. Data can be downloaded to a PC or managed with FreeStyle Co-Pilot PC data management system.
	5 years	Built-in button	Yes	Small blood sample (0.3 microliters). Offers various testing sites. Large display. Strip insertion turns monitor on. Sample is pulled into the strip by capillary action. More blood can be added, using the same target area on the strip, for up to 1 minute. 250-test memory with date, time, 14-day average. Data can be downloaded to a PC or managed with Precision Link 2.6 data management system.
	3 years	Built-in single button	Yes	75-test memory with optional display of date and time; simple, 3-step test procedure; large, easy-to-handle test strips; single-button coding. Data downloading with OneTouch software.

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BLOOD GLUCOSE MONITORS AND DATA MANAGEMENT SYSTEMS *continued*

Name (Manufacturer/Distributor)	Size (inches)	Weight (ounces)	Test Strip Used*	Range (mg/dl)	Test Time	Battery
OneTouch SureStep (LifeScan)	3.5 × 2.4 × 0.8	3.8	OneTouch SureStep	0–500	15–30 sec.	(2) AAA alkaline (home change)
OneTouch Ultra (LifeScan)	3.1 × 2.2 × 0.8	1.5	OneTouch Ultra	20–600	5 sec.	1 replaceable 3-volt CR 2032 (or equivalent) lithium battery
OneTouch Ultra2 (LifeScan)	3.12 × 2.25 × 0.9	1.5 (with batteries)	OneTouch Ultra	20–600	5 sec.	(2) 3-volt CR 2032 lithium
OneTouch UltraSmart (LifeScan)	3.8 × 2.3 × 0.9	2.8 (with batteries)	OneTouch Ultra	20–600	5 sec.	(2) AAA alkaline (home change)
Precision Xtra (Abbott Diabetes Care)	2.94 × 2.1 × 0.64	1.48	Precision Xtra	20–500	5 sec. glucose; 10 sec. ketones	(2) AAA home change (1) CR 2032 lithium battery
Prestige IQ (Home Diagnostics, Inc.)	4.0 × 2.75 × 0.75	3.6	Prestige Smart System	25–600	10–50 sec.	AAA
QuickTek (Arkray)	3.9 × 2.0 × 0.75	2.1	QuickTek	20–600	10–30 sec.	3-volt (CR 2032)
ReliOn Ultima (Wal-Mart Pharmacies)	2.94 × 2.1 × 0.64	1.48	ReliOn Ultima	20–500	5 sec.	(1) CR 2032 lithium battery
Rightest GM300 (Bionime)	3.3 × 2.3 × 0.86	2.9	Rightest GS 300	10–600	8 sec.	(2) AAA
Sidekick Testing System (Home Diagnostics, Inc.)	1.7 × 1.5 × 2.5	1.6	Built in	20–600	<10 sec.	Built in
TrueTrack Smart System (Home Diagnostics, Inc.)	3.5 × 2.1 × 0.67	1.7	TrueTrack Smart System	20–600	10 sec.	CR 2032 or 3-volt lithium

*These are test strips approved by the manufacturers. In some cases, manufacturers cannot guarantee results or provide assistance if any other test strips are used.

	Warranty	How Calibrated	Control Solution	Features
	3 years	Built-in single button	Yes	Single-button testing. Touchable test strip; off-monitor dosing; large display; 150-test memory; 14- and 30-day test averaging; data downloading to personal computer with OneTouch software.
	3 years	Built-in single button	Yes	Alternate site testing; small blood sample; easy blood application with OneTouch Ultra test strip, including confirmation window; 150-test memory with date and time; 14- and 30-day test averaging; no cleaning necessary; data downloading with OneTouch diabetes management software.
	3 years	Built-in buttons	Yes	Before- and after-meal averages for the past 7, 14, and 30 days; 500-test memory; ability to flag results with comments; alternate site testing; data downloadable with OneTouch diabetes management software; diabetes educational DVD and booklet; 2-way scroll buttons; built-in backlight.
	3 years	Built-in buttons	Yes	Electronic logbook and blood glucose monitor in one. Small blood sample; easy blood application; confirmation window; 3,000+ test and logbook; 7-, 14-, 30-, 60-, and 90-day test averaging. Data downloading with OneTouch diabetes management software. Warning to check ketones at 240 to 600 mg/dl.
	Lifetime	Calibrator in each box of test strips	Precision High/Low and Normal control solution	Measures blood glucose and blood ketone levels. SmartChip technology provides automatic test strip upgrades. TrueMeasure technology minimizes effects of agents like Tylenol, vitamin C, and uric acid for glucose-specific results. Two-step testing; end-fill/top-fill design; downloadable 450-test memory; large backlit display. New blood ketone strip requires only 1.5-microliter blood sample; results in 10 seconds.
	5 years	Standard strip	Yes	Accurate results, data management including date and time and 14- and 30-day averaging, large digital display, and Internet uploading capabilities, allowing patients to track, graph, record, and share test results. Test strips are highly absorbent. Sample size confirmation on back of test strip.
	5 years	Built-in button	Yes	250-test memory with time and date. Data downloading with GlucoBalance data management software. Large test strip for easy handling, small sample size (3.5 microliters), 2-step testing.
	1 year	Calibrator on each box of strips	No (available via toll-free #)	0.6-microliter sample size. Fingertip or forearm testing. End-fill test strips, with 7-, 14-, and 30-day averaging. Large display with Spanish capability. Download your results. Wallet-sized carrying case, lancing device, 10 lancets and logbook included. Individually wrapped strips.
	5 years	Snap-in smart code key	No	Large strip is easy to handle; large display screen; 300-test memory capacity; results in 8 seconds; monitor is palm-sized; 1.4-microliter blood sample size; one step code number setting; PC download for self-management; batteries are replaced easily.
	N/A	No coding required	No	Vial of 50 test strips with blood glucose monitor built onto top of vial. No coding required. All the basic features of traditional monitor including fingertip or forearm testing, 1-microliter sample size, and test results in less than 10 seconds. Discard vial when empty (or upon expiration date).
	5 years	Code chip	Yes	Biosensor technology. Accurate test results in 10 seconds with a 1-microliter blood sample. Alternate site testing. TrackEase Smart System also available. For more details go to www.thesmartchoice.com .

COMBINATION BLOOD GLUCOSE MONITOR, LIPID, AND KETONE TEST

Name (Manufacturer/Distributor)	Size (inches)	Weight (ounces)	Test Strip Used	Range (mg/dl)	Test Time
CardioChek (Polymer Technology Systems, Inc.)	5.5 × 3.0 × 1.0	4.3 without batteries	PTS Panels Glucose PTS Panels Cholesterol PTS Panels Ketone PTS Panels Triglyceride PTS Panels HDL	20–600 100–400 2–70 50–500 25–85	30–60 sec. approx. 60 sec. 30–60 sec. approx. 60 sec. approx. 60 sec.

BLOOD-SAMPLING SUPPLIES

Name (Manufacturer/Distributor)	Features and Supplies
Accu-Chek Multiclix Lancet Device (Roche Diagnostics)	Eleven depth settings provide precise control of penetration depth to help avoid contact with nerves. Linear track design minimizes painful side-to-side motion. Uses the Accu-Chek Multiclix lancet drum of six preloaded lancets. Includes clear cap for alternate site testing. Includes two drums (12 lancets).
Accu-Chek Multiclix Lancet Drums (Roche Diagnostics)	For use with the Accu-Chek Multiclix lancet device. Drum of six preloaded lancets. Lancets are self-contained for enhanced safety. 30G lancets. Comes in packages of 102 and 204 (17 and 34 drums).
Accu-Chek Softclix Lancet Device (Roche Diagnostics)	Eleven depth settings provide precise control of penetration depth to help avoid contact with nerves. Linear track design minimizes painful side-to-side motion. Uses Accu-Chek Softclix lancets. Includes clear cap for alternate site testing. Includes 25 lancets.
Accu-Chek Softclix Lancets (Roche Diagnostics)	For use with the Accu-Chek Softclix and Accu-Chek Softclix Plus lancet devices. Comes in packages of 100 and 200. Tips are silicon coated.
Accu-Chek Soft Touch Lancet Device (Roche Diagnostics)	Five depth settings with an adjustable dial provide a personalized level of skin comfort while obtaining an adequate blood sample.
Accu-Chek Soft Touch Lancets (Roche Diagnostics)	Fits most lancet devices. Comes in packages of 100 and 200.
Aimsco Adjustable Lancet Device (Aimsco Delta Hi-Tech)	Five depth settings for greater comfort. Use with Aimsco Lancets.
Aimsco Lancets (Aimsco Delta Hi-Tech)	28G and 30G. Compatible with most lancet devices.
Ames Gluco System Lancets (Bayer HealthCare, LLC, Diabetes Care Division)	Can be used in either Autolet or Glucolet.
Ascensia Microlet Adjustable Lancing Device (Bayer HealthCare, LLC, Diabetes Care Division)	Ergonomic design has easy cocking mechanism and five adjustable settings to control depth of puncture. A clear end cap is also provided for multiple site testing.
Ascensia Microlet Lancets (Bayer HealthCare, LLC, Diabetes Care Division)	For use with Ascensia Microlet Automatic Lancing Device and Ascensia Microlet Vaculance Lancing Device; 28G.
Ascensia Microlet Vaculance Lancing Device (Bayer HealthCare, LLC, Diabetes Care Division)	Vacuum action draws blood to skin surface, allowing patient to choose lancing sites less painful than fingertips, such as forearm, palm, abdomen, or thigh. Four lancing depths. Uses Ascensia Microlet lancets.
Auto-Lancet (Palco Labs, Inc.)	Adjustable-tip, reusable lancing device. Five depth settings, linear tracking and quality design for maximum comfort and least capillary damage. Standard size. Fits most lancets. Two lancets included. Lifetime warranty.
Auto-Lancet Custom (Palco Labs, Inc.)	New design includes custom color and logo and an optional elastomer barrel for improved grip. Fits most lancets. Improved action in a sleek size, with a lifetime warranty.
Auto-Lancet Mini (Palco Labs, Inc.)	Same quality, features, and design as the Auto-Lancet, except in compact, mini size. Adjustable tip with 5 settings. Two lancets included. Lifetime warranty.

Battery	Warranty	How Calibrated	Control Solution	Features
(2) AAA alkaline	1 year	Automatic calibration curve: Input from MEMo Chip, included in each box	Yes	Multiple blood chemistry testing (glucose, total cholesterol, ketone, triglyceride, and HDL); 3-step testing; internal result storage/review. Auto or manual shut off. CLIA-waived; sold over the counter. Test strips sold separately.

Name (Manufacturer/Distributor)	Features and Supplies
Auto-Lancet Prima (Palco Labs, Inc.)	Needle-lock function immobilizes lancing activation, eliminating accidental sticks and potential blood contamination. Provides precise blood samples, while reducing sensation of pain. Ergonomic shape and feel; advanced needle tracking system available. Needle-ject function ejects used lancet in a single motion, making it easy and safe to change lancets.
Autolet Clinisafe (Owen Mumford)	Finger lancet device with 20 platforms (10 each of different depths), 10 Unilet lancets, and vinyl wallet.
Autolet Impression Lancing Device (Owen Mumford)	Small pen-style device with multiple adjustments for control and comfort. Seven penetration depth settings, adjustable spring force, alternate site testing capabilities, and Comfort Zone Technology, which helps mask the feeling of puncture. Universal lancet compatibility.
Autolet Lite (Owen Mumford)	Finger lancet device with three platform depths, 1.8 mm, 2.4 mm, 3.0 mm, self-arming; lancet ejection for safety; includes 10 ComforTouch lancets and instructions.
Autolet Mini (Owen Mumford)	Two devices in one package; two depth platforms offer choice of blood flow, contour grips assist handling, includes 10 Unilet ComforTouch lancets and multilingual instructions; compatible with most lancets.
Autolet Platforms (Owen Mumford)	Disposable and ejectable; to be used with Autolet II Clinisafe and Autolet Lite lancing devices to prevent cross-infection and to control penetration depth; choice of three depths: 1.8 mm (white), 2.4 mm (yellow), 3.0 mm (orange).
BD Genie Lancet (BD)	Safety-engineered lancet. Single-time use. Lancet and lancing device in one. 28G. Package of 200.
BD Ultra-Fine Lancing Device (BD)	Compatible with most lancets; comes with three BD Ultra-Fine lancets; 5-year warranty. Six depth settings; helps make blood sampling less painful.
BD Ultra-Fine 33 Lancets (BD)	Thinnest lancets available. 33G. Designed for use with BD Logic Blood Glucose Monitor.
BD Ultra-Fine II Lancets (BD)	30G lancet; ultra-thin for greater comfort. Fits BD Lancet Device and most other lancet devices.
EZ-Ject Lancets (Can-Am Care, LLC)	Fits most lancing devices; available in traditional lite-angle, assorted colors, and thin gauge.
EZ-Lance (Palco Labs, Inc.)	Advanced design for single-use, disposable safety lancet. Four sizes. Ergonomic and intuitive to use. High-quality design and performance reduce pain and finger damage. Safety features prevent reuse and contamination.
EZ-Lancets (Palco Labs, Inc.)	Three sizes: 21G, 26G, and 30G. High-quality needle edges for maximum comfort and least capillary damage. Fits most reusable lancing devices, including Auto-Lancet. Packages of 100 and 200 count.
FreeStyle Lancets (Abbott Laboratories)	Available in packages of 100. 25G.
Gentle Draw Lancing Device (Home Diagnostics)	Highly portable; lightweight. Five depth settings for optimal skin penetration. Easy to use. One-hand lancing with comfortable trigger button.

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BLOOD-SAMPLING SUPPLIES *continued*

Name (Manufacturer/Distributor)	Features and Supplies
Glucollet Automatic Lancing Device (Bayer HealthCare, LLC, Diabetes Care Division)	Comes with 10 lancets, one opaque regular puncture endcap, multilingual instruction insert.
Haemolance (Arkray)	Single-use disposable lancet with built-in needle protection system; needle retracts automatically to eliminate risk of cross-contamination and accidental needle punctures.
Haemolance Plus (Arkray)	Single-use disposable lancet that eliminates the need for a separate lancing device. Design protects the needle point after the protective cap is removed. In use, needle is not seen. Lancing is a one-motion process. After use, the needle automatically retracts to protect against accidental punctures.
Lady Lite Lancet (Medicare)	Designed for the feminine fingertip; fine, delicate tip for comfort; floral cap; fits most lancet devices. Made in the United States.
Lite Touch Lancets (Medicare)	Precision ultrafine ground tip for maximum comfort. Fine gauge. Fits most lancing devices.
Lite Touch Lancing Device (Medicare)	Stainless steel for durability. Adjustable; uses most lancets. Supercompact pen style. Soft spring for maximum comfort.
Medi-Lance Lancets (Medicare)	Precision tri-bevel comfort tip; fits most lancing devices. (For those with callused fingers or those in need of a large sample.) Made in the United States.
Medi-Lance II Lancets (Medicare)	Tri-bevel comfort tip; extralong body; fits Glucollet, Autolet, and Medi-Let.
Monolet Original Lancets (Can-Am Care, LLC)	Fits most lancing devices; designed for those with more callused fingertips or who have difficulty getting the right amount of blood.
Monolet Thin Lancets (Can-Am Care, LLC)	Fits most lancing devices; designed for those who have sensitive fingertips or who easily produce an ample droplet of blood.
MPD Lancet (Medical Plastic Devices)	North American-made lancets with shallow point design, sterile tip, and tri-bevel stainless steel needle that permits smooth insertion into the skin.
OneTouch FinePoint Lancets (LifeScan)	25G; single-use lancets fit most lancing devices; available in boxes of 100; protective cap snaps over needle for disposal; polished and coated for less painful blood sampling.
OneTouch Penlet Plus Adjustable Blood Sampler (LifeScan)	Pen-shaped with seven easy-to-dial depth settings; hands-free lancet removal; uses OneTouch UltraSoft lancets and OneTouch FinePoint lancets.
OneTouch UltraSoft Adjustable Blood Sampler (LifeScan)	Pen-shaped with a thin tip for less painful penetration; includes OneTouch UltraClear Cap for arm testing; seven depth settings; uses OneTouch UltraSoft lancets and OneTouch FinePoint lancets.
OneTouch UltraSoft Lancets (LifeScan)	28G; single-use lancets fit most lancing devices; available in boxes of 100; protective cap snaps over needle for disposal; polished and coated for less painful blood sampling.
Select Lite Lancing Device (Arkray)	Pen-shaped device is compatible with most lancets; adjustable tip; five settings.
Sterile Lancets (Home Diagnostics)	Tri-bevel. Ultrathin tip for smooth, controlled skin penetration. Protective cap for safe disposal after use.
Store brand lancing device (Can-Am Care, LLC)	Compatible with most lancets; offers five depth settings; packaged with one lancing device and sample lancets. Available in various store brands.
TechLite Lancets (Arkray)	Fits most devices; available in 26G and 28G; packages of 100 or 200.
Tenderlett (ITC)	Surgical blade produces shallow 1.75-mm incision, minimizing pain; permanently retracting steel blade for safety. Appropriate for use when slightly more blood is needed. Individually packaged and sterilized.
Tenderlett Jr. (ITC)	Same surgical blade features and action as the Tenderlett, but produces a shallower 1.25-mm incision for use with children. Appropriate for use when fingers are slightly callused or when fingers have poor peripheral circulation.

Name (Manufacturer/Distributor)	Features and Supplies
Tenderlett Toddler (ITC)	Same surgical blade features and action as the Tenderlett, but produces a shallower 0.85-mm incision. Incision yields one drop of blood, appropriate for most blood glucose checks. Individually packaged and sterilized.
UltiCare Lancets (UltiMed, Inc.)	UltiCare 30G lancets for use with most lancing devices; comes in packages of 100.
Unilet ComforTouch (Owen Mumford)	Ultrathin 28G lancet for use with most lancing devices; comes in packages of 100 and 200. Safety cap ensures safe disposal and identification of a used lancet.
Unilet ExceLite (Owen Mumford)	23G lancet that fits most automatic lancing devices; designed for increased blood flow with maximum comfort. Available in 100 and 200-count boxes.
Unilet ExceLite II (Owen Mumford)	28G ultrathin lancet that fits most automatic lancing devices; designed for increased blood flow with maximum comfort. Available in 100 and 200-count boxes.
Unilet G.P. Lancet (Owen Mumford)	Fits most automatic lancing devices; packages of 100 or 200; white; 21G.
Unilet G.P. Ultralite (Owen Mumford)	Fits most lancing devices. Ultrathin 28G lancet with tri-bevel point; suited for sensitive fingers; package of 100 or 200.
Unilet G.P. Superlite Lancet (Owen Mumford)	Fits most automatic lancing devices; package of 200; white; 23G.
Unilet Superlite Lancet (Long body) (Owen Mumford)	23G; for use with Autolet II Clinisafe, Autolet Lite, and Glucolet lancing devices, or manual use; in packages of 200; white.
Unistik 1 (Owen Mumford)	Single-use device; lancet automatically retracts for safety; needle hidden before and after use; available in 2.4-mm (yellow) and 3.0-mm (orange) penetration depths; 50 per box.
Unistik 2 (Owen Mumford)	Single use for safety and disposability; punctures and retracts automatically; five models available for different levels of blood flow needs. Normal (yellow); Extra (orange); Super (burgundy). Available in boxes of 50, 100, and 200.
Unistik 3 (Owen Mumford)	Preset single-use lancet for safety and easy disposal. Visual lock-out feature indicates the device has been used and is ready for disposal. Normal and comfort; easy to use; available in boxes of 25, 100, and 200. Features Comfort Zone Technology to mask the feeling of puncture.
Various store brand lancets (Can-Am Care, LLC)	100 and 200 ct. (Standard, Thin, and Ultra/Super Thin). Sold by CVS, Walgreens, Albertson's, Wal-Mart (ReliOn), Medicine Shoppe, Kroger, Leader, Longs, Kmart (Value Plus), Meijer, Sunmark, Good Neighbor, Shop Rite, Preferred Plus, Hyvee.

STRIPS FOR VISUAL BLOOD GLUCOSE READING

Name (Manufacturer/Distributor)	Color Chart Increments (mg/dl)	Instructions for Use
Chemstrip bG (Roche Diagnostics)	20, 40, 80, 120, 180, 240, 400, 800	Wipe after 1 minute; read after 2.
Glucostix Reagent Strips (Bayer HealthCare, LLC, Diabetes Care Division)	20, 40, 70, 110, 140, 180, 250, 400, 800	Blot after 30 seconds; wait an additional 90 seconds; read.
Supreme Strips (Arkray)	low, 40, 70, 120, 180, 240, 400, high	Apply blood to test areas; wait 60 seconds and turn strip over; compare color of reverse side to color chart.

GLYCOHEMOGLOBIN TESTS

Name (Manufacturer/Distributor)	Comments
AccuBase A1c Glycohemoglobin Test Kit (Diabetes Technologies, Inc.)	Fingerstick A1C mail-in test kit. FDA-approved for over-the-counter sales. Sample sent to CLIA-licensed, CAP, NGSP reference method lab (CVs < 1.0 percent). Lab report includes review of chromatogram by pathologist for presence of abnormal hemoglobins (S, C, F), abnormal peaks, and/or red blood cell disturbances (anemia or polycythemia). Positive patient ID (HIPPA compliant); confidential patient tracking. Approved for diabetes or impaired glucose tolerance screening. Results reported by mail, fax, electronically (e-mail or DTI Web site). www.diabetestech.com .
A1c At Home (FlexSite Diagnostics, Inc.)	Home sample collection kit for mail-in laboratory A1C testing. Dried blood sample from fingerstick is mailed to FlexSite Diagnostics' CLIA-licensed laboratory. Results reported by mail, fax, or electronically. FDA approved for over-the-counter sales. Certified by the National Glycohemoglobin Standardization Program. For more information, go to www.flexsite.com .
BioSafe Hemoglobin A1c Test Kit (BioSafe Medical Technologies, Inc.)	Self-collection kit with the precision and accuracy of a reference laboratory analysis. Includes collection kit, prepaid postage to the lab, processing, results mailed back to the patient, and a toll-free customer support line to answer questions about the test or results. FDA approved for over-the-counter distribution. CLIA-licensed and CAP-accredited laboratory assures reporting standards. For more information, visit www.ebiosafe.com , or call 1-888-700-8378.

METER SUPPLIES

Name (Manufacturer/Distributor)	Product	Features
Sure Drop (Captek/Science Products)	Device	Fits over the LifeScan OneTouch Basic; directs blood onto the test spot.
Sure Guide Strip Guide (Captek/Science Products)	Device	Aids in collecting blood sample for the Sure Step blood glucose meter. Notched groove directs blood sample to the meter strip.

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your system, he or she can get a complete and accurate record of your results over a period of time. (Some systems allow downloading to your doctor's computer by modem.) This information can then help you and your health care team design a plan for improving your treatment.

Another advantage of data management systems is that the information collected can be transferred to a computer and plotted on a graph. A graph allows you and

your health care team to see patterns of blood glucose levels and determine at a glance what your blood glucose control has been over a given period of time.

If you're in the market for a data management system, you'll want to do a little homework first. Here are a few tips to help you decide which system to buy:

Compatibility. If you buy a system that is not compatible with your blood glucose monitor, your home computer, or your doctor's

computer, you may be in for an unpleasant surprise when you go to use it. In computer language, compatibility refers to the fact that two systems are able to "speak" the same language. If two systems aren't compatible, they won't be able to "talk" to each other.

Size and convenience. Some data management systems are part of the blood glucose monitor itself. Others must be connected to the monitor. If you don't want to keep track of two units, get the

kind that is combined into one unit.

Type of records. Ask your doctor what information about your treatment plan he or she needs you to record. For some, glucose values with the time and date may be enough. Other doctors may want you to record information on exercise, insulin dosage, diet, or other pertinent facts. It's important to decide what your needs are beforehand and purchase a system that will have the capability to meet those needs.

Ease of use. While you don't need to be a computer programmer to use these data management systems, some may be harder for you to operate than others. If you can, try several before buying.

It may help to ask a diabetes educator on your health care team which products he or she would recommend.

Expense. A data management system is a luxury, not a requirement. So you must decide whether you want to spend your money on one. And you can spend a lot on these systems—especially if you choose to purchase a personal computer and printer. You have to decide what your wants are and what you can afford. Technology is changing so rapidly that new systems are being developed at a quick pace.

Data management systems are not for everyone. However, they can make the work of gathering and reviewing information concerning diabetes care more convenient. If you decide to buy a data management system, take the time to do some research and find a system that will satisfy your needs.

Products For Testing Glycohemoglobin

The American Diabetes Association recommends that all people using insulin have glycohemoglobin (A1C) tests quarterly, if treatment changes or the patient is not meeting goals, or twice a year otherwise. Those not using insulin should have the tests every 6 months, or as often as necessary to maintain good blood glucose control. These tests provide an estimate of average blood glucose control over the previous 2 to 3 months.

Traditionally, people visit their doctors for these tests. However, kits are now available for performing A1C tests from home; when used properly, these kits are reported to provide accurate results. Always check with your doctor about the use of A1C kits. And make sure that if you do use the home kit, you have a good understanding of what the results mean.

When using all but one of these kits, you'll place a drop of blood on a test strip and send the sample to a lab. You'll then be notified of the results by mail. If you decide to use these kits, we urge you to perform the first couple of tests under the supervision of your physician or diabetes specialist to ensure that you are doing the test properly.

Some systems, however, do allow you to test your A1C and provide results without having to mail in a sample.

Keep in mind that you should continue to discuss the results of these tests with your physician so he or she can track your progress. (Some people with unusual hemoglobin types may have A1C levels that do not reflect their glycemic control, and that's another reason to consult with your doctor.)

Blood-Sampling Supplies

Lancets and automatic lancing devices are frequently provided as part of blood glucose monitoring kits. Most lancet devices come with short and long lancet covers to provide different degrees of penetration, and many have adjustable covers or caps. Generally, people who are first-time users, children, or people with delicate skin prefer a longer cover for more shallow penetration of the lancet. People who have tougher or thicker skin or poor circulation often choose a shorter cover for deeper penetration by the lancet. An individual may need to use different lancet covers for different fingers or when finger temperature affects blood flow.

Ease of resetting the lancet for the next use varies. Some products require the cover to be removed so that the lancet can be pushed back into position. Others have a simple push-pull mechanism that resets the spring. The latter may be preferable for children or people with coordination problems.

It's a good idea to keep an automatic lancing device at each place you may test—at home, at work, at school—so you won't have to carry one from place to place. Automatic lancing devices are inexpensive and last a long time, so owning more than one should be affordable. Remember that you should never share your automatic lancing device because of the small but real risk of transmitting disease by contaminated blood.

Discuss these considerations and others, such as lancet reuse and sterilization, with your health care provider. ▲