

Blood Glucose Monitoring System Purchase

This is a recommendation report on choosing a blood glucose monitoring system. Systems that enable individuals to measure their own blood glucose levels are essential to managing diabetes. In the United States, there are over 2.5 million regular users of glucose monitors; 8.8 million persons are currently diagnosed as having diabetes and over 600,000 new diagnoses are made each year. There are high barriers to entry in this, the largest home testing market, which is dominated by several major international players. Some people test their blood once a day. Others test their blood three or four times a day. Your doctor may want you to test before eating, before bed, and sometimes in the middle of the night. Ask your doctor how often and when you should test your blood sugar. The purchase of a blood glucose monitor should take into consideration the following criteria:

- Ease of use
- Features
- Speed of results
- Suitability for use by children under ten years old and by children over ten years old and adults
- Cost of the monitor

The monitor would need to be usable for all ages. This would mean that it would need to have the ability to read the glucose with ease. This is a very subjective rating and could easily vary from person to person. But meters that require you to wipe their strips are inherently more difficult to use than ones that don't.

Product Descriptions

There are many meters currently on the market. Some of the best on the market are the AccuCheck monitors made by Roche, One Touch, SureStep and FastTake made by Lifescan, and Glucometer made by Bayer. These products are the best on the market and are aimed at all diabetics to endure correct blood glucose readings.

AccuCheck Advantage. The AccuCheck Advantage is an excellent blood test meter. The AccuCheck Complete is easy enough to use that even young kids will be able to use it by themselves. However, the meter is larger than other meters on the market.

Lifescan's SureStep and FastTake. Testing with the FastTake is easy. The difference between the FastTake and the AccuCheck complete reflects the fact that the FastTake is calibrated to serum glucose values and the AccuCheck Complete is calibrated to whole blood values. FastTake Compact Blood Glucose Monitoring System has a data port, but the cable is not yet available. It will use the LifeScan In Touch software. This meter is plasma-blood calibrated. It requires only a 2.5 μ (2.5 microliter) drop of blood, less than any other meter, and tests in 15 seconds. SureStep Meter lacks a data port. This meter is plasma-blood calibrated.

Lifescan's One Touch. One Touch Profile's data port allows it to work with diabetes management software. This is a whole blood-calibrated meter. One Touch II's data port allows it to work with diabetes management software. This is a whole blood-calibrated meter. One Touch Basic lacks a data port. This is a whole blood-calibrated meter.

Bayer's Glucometer Elite. Glucometer Elite has a unique test strip design that actually sucks the blood into the test chamber, and it requires much less blood (3 microliters) than most meters. Young children, however, will find it very difficult to open the foil wrapped test strip. You have to peel the foil s-l-o-w-l-y down, exposing the electronic contacts that are inserted into the meter. If you pull too quickly, the very small strip will fall out. With a little practice, adults can easily master this. Young children with weak fingers will find it difficult.

Comparisons

The blood glucose monitoring systems listed above will be compared according to (1) ease of use, (2) features, (3) speed of results, (4) suitability for use by children under ten years old as well as by children over ten years old and adults, and (5) cost.

Ease of use. The AccuCheck Advantage is an excellent blood test meter. It's very small (2.25 by 3.5 by 5/8 inches) and lightweight, and fits easily in a child's hand. With dimensions of 4.79" x 2.83" x 1.06" [121.7mm x 72.0mm x 27.0mm] and weighing 4.4 oz [125 g] without batteries, the AccuCheck Complete is much larger than its predecessor, the AccuCheck Advantage. FastTake small size (3.12" x 2.25" x .75", 1.6 ounces with battery) and weight (easily fits in a kid's T-shirt pocket). All monitors still use the blood drop testing except the FastTake and Glucometer Elite.

Features. AccuCheck Advantage has 100 test memory that stores the date and time for each test, data port, common 3-volt coin batteries, and touchable strips. AccuCheck Complete turns on automatically, has 1,000 memories and sophisticated diabetes management software integrated into the meter, extensive averaging as part of integrated diabetes management software, data port for external interface to computer software, and uses two standard AAA alkaline batteries (rated for approximately 1,000 tests). FastTake has 150-test memory for storing blood sugar readings, 14-day averaging, Large, easy-to-read display, Data interface port (cable and software not yet available), and uses two standard watch batteries (rated for approximately 1,000 tests). One Touch Basic is a single memory that displays the last blood sugar reading. And the One Touch Basic still uses the hard-to-find J battery, instead of AAA batteries like the One Touch Profile. SureStep has 10 reading memory, two AAA batteries, visual backup reading of test strip using color chart on strip bottle. Glucometer Elite has 20 result memory, large LCD display that is very easy to read, event associated average blood sugar readings, insulin dosage and carbohydrate counting after each test. AccuCheck Complete has the highest memory.

Speed. AccuCheck Complete test results in 30 seconds. FastTake displays test results in 15 seconds. One Touch Profile test results in 45 seconds. One Touch Basic test results 45 seconds. SureStep test results in 30 seconds. AccuCheck Advantage test results 40 seconds. Glucometer Elite test results 35 seconds. The FastTake has the quickest test result speed.

Suitability for use of all ages. Exceptionally easy to use, even for young children, the small size of the AccuCheck Advantage makes it an excellent meter for at home and on the road. Recommended for children with diabetes who bleed well. Primarily due to the large blood required, the AccuCheck Complete is recommended only for children with diabetes who bleed easily. The FastTake is easy enough to use that even young kids will be able to use it by themselves. All monitors are suitable for all ages in the use of blood testing. Some may need a little help or none at all. FastTake is most suitable to use.

Costs. The cost includes strips (per 100 strips). The cost of the One Touch Profile and One Touch Basic is about \$57. The cost of the SureStep is about \$66. The cost of the AccuCheck Advantage and AccuCheck Complete is about \$55. The cost of the FastTake is about 42. The cost of Glucometer Elite is about \$48. FastTake is the less expensive monitor.

Summary

The following is a summary of the comparison of the Accu-Check, One Touch Profile, One Touch Basic, SureStep, FastTake and Glucometer Elite.

1. All monitors are capable of testing your blood glucose.
2. The SureStep and FastTake are the easiest to use.
3. The One Touch Profile, AccuCheck and FastTake has the most features including memory.
4. The FastTake has the best speed of results.
5. The One Touch Profile, One Touch Basic and FastTake has best suitability by children of all ages.
6. AccuCheck Advantage and AccuCheck Complete have the lowest cost.
7. Even though the FastTake is the most expensive, it is the best choice in all other categories.
8. The extra expense for the FastTake is justified, considering its importance to the health and safety of the user.
9. The FastTake is the best choice of the blood glucose monitoring systems considered in this study.

Table 1. Comparisons of Blood Glucose Monitoring Systems							
Categories	One Touch Profile	One Touch Basic	SureStep	AccuCheck Advantage	AccuCheck Complete	FastTake	Glucometer Elite
<i>Ease of use</i>	9	9	10	9	9	10	9
<i>Features</i>	10	1	5	8	10	10	10
<i>Speed of results</i>	4	4	6	5	5	10	5

Categories	One Touch Profile	One Touch Basic	SureStep	AccuCheck Advantage	AccuCheck Complete	FastTake	Glucometer Elite
<i>Suitability by children under ten years old</i>	10	10	8	8	8	10	8
<i>Suitability by children over ten years old</i>	10	10	8	10	10	10	8
<i>Cost</i>	7	7	3	8	8	2	3
TOTALS	50	41	40	48	50	52	43

Notes:

- *Ease of use:* Scores range from 1 (Mommy, help!) to 10 (I did it all myself!).
- *Memory:* One-reading memory scores 1 point; multiple-reading memory score 2 points.
- *Data port:* A data port scores 2 points.
- *Batteries:* AAA or other common batteries scores 2 points.
- *Automatic averaging:* Averaging adds 2 points.
- *Other data features:* Additional data features add up to 2 more points.
- *Speed of results:* Scores range from 0 (120 seconds or more) to 10 (10 seconds or less).
- *Suitability for children under 10:* Scores range from 1 (forget it) to 10 (no problem).
- *Suitability for children over 10:* Scores range from 1 (forget it) to 10 (no problem).
- *Costs:* Scores range from 0 (more than US\$75 per 100 strips) to 10 (less than US\$50 per 100 strips).
- *Overall rating:* 60 is perfect.

Recommendations

Based on the criteria previously discussed in this report, and the ratings from Table 1, I recommend the following:

- Purchase the FastTake blood glucose meter which has the highest score even in cost.
or
- Ask your doctor or diabetes educator for advice on which one to buy.

Literature Referenced

1. Dillon, Alison E. "Blood Glucose Meters." *American Journal of Obstetrics and Gynecology*. (November, 1997), 6-7.
2. Mediconsult.com Limited. Cambridge, MA.