

Self Blood Glucose Monitoring in Type 2 Diabetes

a report by

Lois Jovanovic, MD

Chief Executive Officer and Chief Scientific Officer, Sansum Diabetes Research Institute

DOI: 10.17925/USE.2006.00.1.32

People with poor glucose control are more likely to suffer from complications of diabetes such as ischemic heart disease and microvascular disorders such as renal and eye disease. They are also more likely to die from a diabetes-related cause. Good glucose control is vitally important and it is best accomplished when doctors and patients work together toward achieving this goal.

In some parts of the world there is controversy about whether self blood glucose monitoring in patients with type 2 diabetes is worthwhile. Those who believe home monitoring is not suitable for all persons with type 2 diabetes say it can have an adverse effect on quality of life. Perhaps this perception is because patients are not guided to act on the abnormal blood glucose and thus feel hopeless and helpless. There is consensus regarding people with type 1 diabetes and people with type 2 who use insulin. Monitoring of blood glucose as part of self-management programs is seen as necessary.

Early studies to investigate whether home monitoring has beneficial or adverse effects on type 2 patients that managed their disease through exercise and diet were not conclusive, to say the least. The studies were poorly designed, lacked statistical power, and were difficult to compare as the groups of patients were different and because glucose monitoring may have been just one part of a multifactorial intervention programme. More recent studies and observational studies do indicate that glucose monitoring lowers glucose levels by a statistically significant amount.

Most physicians who treat patients with type 2 diabetes find self monitoring of blood glucose an invaluable aid in their treatment strategy. Some advocate continuous glucose monitoring. The main advantage of this is that it can help identify fluctuations and trends that would otherwise go unnoticed with standard HbA_{1c} tests and intermittent finger stick measurements. For example, the device can detect dangerously low overnight blood glucose levels, high blood sugar levels between meals, early morning spikes in blood sugar, and evaluate how diet and exercise affect blood sugars. In addition, it can provide up to a 72-hour complete review of the effects of changes made to therapy by the healthcare team.

A recent multicenter randomized study involving 91 patients (*Diabetes Care* (2006);29:44-50) demonstrated that realtime continuous glucose monitoring for periods up to 72 hours is accurate and safe in insulin-requiring subjects with type 1 and type 2 diabetes. The study also showed that availability of realtime, continuously measured glucose levels can significantly improve glycemic excursions by reducing exposure to hyperglycemia without increasing the risk of hypoglycemia, which may reduce long-term diabetes complications and their associated economic costs.

Type 2 diabetes is heavily influenced by eating patterns. Measuring blood glucose after each meal is the best way to achieve behavior modification toward healthier eating. If a patient measures their glucose level after a meal and it is very high, they are likely to be more careful about what they eat next time. It is a good motivational tool. Practice varies among healthcare professionals with regard to the recommended frequency of home blood glucose monitoring. In an ideal world, blood glucose levels would be measured four times a day: when a patient wakes up and then after the three daily meals. If this is not possible, the next best option would be to measure glucose levels after the biggest meal of the day.

Other than behavior modification, there are additional benefits of self monitoring:

- It allows people with other conditions to assess if they are feeling unwell due to blood glucose levels or other causes. This is particularly useful for people with multiple conditions.
- It gives people confidence about their glucose levels at critical times, such as prior to driving or in a work context.
- It provides reassurance and supports psychological well-being by increasing feelings of control.
- It enables temporary insulin use.

However, it is essential that for people with diabetes to obtain the maximum benefit from self-monitoring that they know what the results mean for them personally. This requires a program of information, education and support. ■