

# Review: Self-monitoring does not improve blood glucose control in type 2 diabetes mellitus

Coster S, Gulliford MC, Seed PT, Powrie JK, Swaminathan R. Self-monitoring in type 2 diabetes mellitus: a meta-analysis. *Diabet Med*. 2000 Nov;17:755-61.

## QUESTION

What is the effectiveness of self-monitoring for improving blood glucose control in patients with type 2 diabetes mellitus?

## DATA SOURCES

Studies were identified by searching MEDLINE, EMBASE/Excerpta Medica, the Index of Bibliography of Social Science, and the Cochrane Library with terms that included diabetes mellitus, self-monitoring of blood glucose, and randomized controlled trials. Hand searches of diabetes journals, bibliographies of relevant papers, and the authors' personal reference files were scanned. Manufacturers and the British Diabetic Association were also contacted.

## STUDY SELECTION

English-language studies were selected if they were randomized controlled trials (RCTs) that assessed the effectiveness of blood or urine glucose self-monitoring for improving blood glucose control, as measured by

glycated hemoglobin levels in patients with type 2 diabetes mellitus.

## DATA EXTRACTION

Data were extracted on study design, inclusion criteria, interventions, methodologic quality, patients, and results.

## MAIN RESULTS

8 RCTs (mean age range 54 to 65 y) that included 734 patients met the selection criteria. Study durations ranged between 3 and 12 months. The mean methodologic quality score was 15 on a scale that ranged between 0 and 28. Three studies were estimated to have sufficient power to detect differences in glycated hemoglobin levels between 0.5% and 1%, and 4 studies were estimated to have sufficient power to detect differences > 1%. 2 studies (1 that used fructosamine as the outcome measure and 1 that used cluster randomization) were excluded from the meta-analysis. Meta-analysis of 4 studies (285 patients) showed that no difference existed between blood

or urine glucose self-monitoring and no regular monitoring for blood glucose control (weighted mean change in glycated hemoglobin level -0.25%, 95% CI -0.61% to 0.10%). Meta-analysis of 3 studies (278 patients) showed that blood glucose self-monitoring and urine glucose self-monitoring for blood glucose control did not differ (weighted mean change in glycated hemoglobin level -0.03%, CI -0.52% to 0.47%).

## CONCLUSION

Blood or urine glucose self-monitoring does not improve blood glucose control in patients with type 2 diabetes mellitus.

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*For correspondence:* Dr. M.C. Gulliford, Department of Public Health Sciences, Guy's, King's and St. Thomas' School of Medicine, King's College London, Capital House, 42 Weston Street, London SE1 3QD, England, UK. FAX 44-207-848-6605. ■

## COMMENTARY

Clinicians who care for patients with chronic diseases are often faced with patients' lack of adherence to treatment recommendations. Many treatment regimens are complex and require adherence for long periods (e.g., lifestyle modification). In general, isolated methods to improve adherence have been ineffective (1). Multidimensional strategies that promote and support patient self-management are potentially more efficacious than one-dimensional strategies. The assumption behind these strategies is that patient self-management leads to improved and sustained patient outcomes.

Self-monitoring allows patients with diabetes to make treatment decisions and evaluate their effect on glucose control with the support of a health care team. Patients who practice self-monitoring become empowered to adjust their diet, exercise, and medications when they receive real-time information from glucose monitors and test strips. In type 1 diabetes, glucose self-monitoring is critical in guiding medication adjustments in multiple-dose insulin programs.

The review by Coster and colleagues found that self-monitoring in type 2 diabetes was ineffective in reducing glycated hemoglobin levels. Most of the studies included in this review tested self-monitoring as the only or primary adherence improvement strategy. Thus, the best

available evidence suggests that glucose self-monitoring without a self-management support program is ineffective in reducing glycated hemoglobin levels.

Clinics that support a self-management approach design the resources within their health care system and community to help patients achieve their goals. Patients learn to use test values to evaluate their efforts. Patients who are unsuccessful with self-management can find help from their family, social workers, educators, dietitians, nurses, and physicians. In this context, values obtained from test strips and monitors have meaning, and self-monitoring may be effective (2).

*Victor Montori, MD  
Mayo Clinic  
Rochester, Minnesota, USA*

## References

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