



Society of General Internal Medicine

Choosing Wisely – 5 Things Physicians & Patients Should Question

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Don't recommend daily home finger glucose testing in patients with Type 2 diabetes mellitus not using insulin.

Self-monitoring of blood glucose (SMBG) is an integral part of patient self-management in maintaining safe and target-driven glucose control in type 1 diabetes mellitus. However, daily finger glucose testing has no benefit in patients with type 2 diabetes mellitus who are not on insulin or medications associated with hypoglycemia, and small, but significant, patient harms are associated with daily glucose testing. SMBG should be reserved for patients during the titration of their medication doses or during periods of changes in patients' diet and exercise routines.

Summary of Update

We searched PubMed, Embase, and Cochrane databases from 2012 to 2015 for systematic reviews and meta-analyses of SMBG in patients with type 2 diabetes mellitus on noninsulin therapies. After screening 17,373 citations, we found 452 systematic reviews and meta-analyses, of which 2 were relevant.

Discussion

SMBG involves intermittent capillary blood monitoring with the use of a glucose meter and specialized testing strips. Results from the Diabetes Control and Complications Trial demonstrated the effectiveness of daily SMBG in preventing long term complications in type 1 diabetes mellitus.^{1,2}Based on these findings, the American Diabetes Association recommends daily frequent monitoring of blood glucose in insulin-requiring patients with type 1 diabetes.³

In patients with type 2 diabetes managed with noninsulin therapies or medical nutrition therapy SMBG is commonly recommended by physicians despite the lack of clear evidence linking SMBG to improved glycemic control. Multiple observational studies of daily finger glucose testing yielded conflicting results.⁴⁻⁸ Recent meta-analyses of randomized trials of daily glucose testing in patients with type 2 diabetes on oral agents showed either no benefit or a statistically significant but clinically insignificant reduction in hemoglobin A1c.⁹⁻¹²

Unnecessary daily glucose testing in type 2 diabetes patients has important negative consequences. It is burdensome for frail elderly patients, those with cognitive or visual impairment, and those with neurological or musculoskeletal diseases. Studies have shown higher depression scores among patients who monitored daily blood glucose, and concerns by patients that SMBG values are a “proxy of good and bad behavior.”^{13,14} If SMBG data is not used for medication adjustments it can negatively impair adherence and confuse patients about the value of the SMBG.^{14,15} SMBG also has the unintended consequence of shifting focus away from the more important cardiovascular risk factors such as hypertension and hyperlipidemia. The economic impact of unnecessary testing is staggering as well. In 2002, Medicare reported a cost of SMBG in the U.S. as close to \$500 million/year while in other industrialized countries it may account for 10 percent of all spending on diabetes care alone.¹⁶ Recent cost effectiveness analyses of SMBG in patients with type 2 diabetes not receiving insulin estimate that the incremental cost per quality-adjusted life year is \$113,643.¹⁶⁻¹⁷

Given this body of evidence, the American Diabetes Association in its most recent consensus statement concluded that SMBG is unnecessary in patients with type 2 diabetes who are not on insulin.¹⁸

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