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Cost-effectiveness of Blood Glucose Monitoring Is Controversial

TO THE EDITORS:

We are writing to express our concerns about the cost-effectiveness analysis by Tunis and Minshall on self-monitoring of blood glucose (SMBG) in type 2 diabetes.¹ In their base case, they assumed that (1) the cohort would have an average glycosylated hemoglobin (A1C) concentration of 8.6% and that (2) the reductions in blood sugar attributable to SMBG, at varying levels of testing, would be constant. These assumptions, in turn, were based on a study by Karter et al that used administrative data.² In that analysis, patients who began SMBG (new users) had better control than those who did not (persistent nonusers), and new users who tested 3 times daily improved their glycemic control more than those who tested twice or once daily.² However, Karter et al did not show whether the reduction reportedly due to SMBG was consistent for different levels of initial glycemic control.

Thus, Tunis and Minshall used the numbers provided by Karter et al for their base case analysis, but then did not present a sensitivity analysis for these assumptions. Clearly, not all patients on oral hypoglycemic agents will start SMBG with that level of A1C and, even if there were to be a benefit (which itself is open to debate), the benefit would likely change depending on the initial level of glycemic control. Furthermore, different initial levels of glycemic control, as well as subsequent control, have implications for longer term clinical outcomes. However, the limited sensitivity analysis did not account for this. For example, what happens when the baseline glycemic control at initiation is different? What happens when the benefit of SMBG for glycemic control varies? The authors themselves recognize the limitations, in part, as they state: "Another factor that influences the results of any cost-effectiveness analysis is the cohort definition. For this study, the cohort had an average illness duration of 12 years and a baseline HbA1C of 8.6%. If patients had represented a 'less severe' or a 'more severe' clinical cohort, results could be expected to differ from those obtained in the present study."¹ In addition, the scatter plots show a fair amount of scatter, indicating uncertainty in the estimates of cost and effectiveness. However, the authors do not address these issues formally, as the sensitivity analyses only included the assumptions regarding the discounting rate and time horizon. Hence, readers cannot assess how altering other crucial assumptions (eg, baseline A1C, benefit of SMBG, relative risk of macrovascular complications) might affect the cost-effectiveness analysis and/or under what conditions SMBG might be cost-effective.

Are their conclusions even valid for the cohort described (patients with type 2 diabetes being treated with oral antidiabetic medications), given that subjects in the model were switched to insulin after 5 years? The benefits of SMBG in patients on

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intensive insulin regimens are well accepted; however, the same is not true for those on oral medications. Indeed, as recent randomized trials failed to show a benefit for SMBG in patients with type 2 diabetes who were not on insulin, the goal should be to develop better clinical trials to address this important issue.^{3,4}

Sherrie L. Aspinall, PharmD, MSc

VA Center for Medication Safety, Hines VA
Hines, Illinois
Center for Health Equity Research and Promotion, VA
Pittsburgh Healthcare System, and University of Pittsburgh
School of Pharmacy
Pittsburgh, Pennsylvania

Peter A. Glassman, MBBS, MSc

VA Greater Los Angeles Healthcare System
and David Geffen School of Medicine at UCLA
Los Angeles, California

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Address correspondence to: Sherrie L. Aspinall, PharmD, MSc, VA Pittsburgh Healthcare System, Center for Health Equity Research and Promotion (151C-H), 7180 Highland Dr, Pittsburgh, PA 15206. E-mail: sherrie.aspinall@med.va.gov.

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