Type 2 Diabetes: Does Daily Self-Monitoring of Blood Glucose (SMBG) Improve A1c Levels and Quality of Life?
DISSEMINATION GRANT

The National Alliance is developing a system to disseminate PCOR/CER findings within the purchaser community that will have a measurable impact on patient-center experiences and can serve as a model for future and continual dissemination.
PCORI REPRESENTATIVE
WILLIAM LAWRENCE
Senior Clinical Advisor, Communications, Dissemination, and Implementation

[Image of William Lawrence]
PCORI’s Broad and Complex Mandate

“The purpose of the Institute is to assist patients, clinicians, purchasers, and policy-makers in making informed health decisions by advancing the quality and relevance of evidence concerning the manner in which diseases, disorders, and other health conditions can effectively and appropriately be prevented, diagnosed, treated, monitored, and managed through research and evidence synthesis...

... and the dissemination of research findings with respect to the relative health outcomes, clinical effectiveness, and appropriateness of the medical treatments, services…”

—from PCORI’s authorizing legislation
PCORI-FUNDED RESEARCHER
KATRINA DONAHUE, MD, MPH
Professor and Vice Chair of Research
UNC Chapel Hill Department of Family Medicine
Type 2 Diabetes: Does Daily Self-Monitoring of Blood Glucose (SMBG) Improve A1c Levels and Quality of Life?
# Current SMBG Guidelines

<table>
<thead>
<tr>
<th>Source</th>
<th>Recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td>American Diabetes Association</td>
<td>YES - May guide treatment and management (expert opinion). Insufficient when and how often</td>
</tr>
<tr>
<td>American College of Endocrinology</td>
<td>YES</td>
</tr>
<tr>
<td>International Diabetes Federation</td>
<td>YES - When results are reviewed and acted upon by health provider</td>
</tr>
<tr>
<td>National Diabetes Educators</td>
<td>YES</td>
</tr>
<tr>
<td>Canadian Diabetes Association</td>
<td>YES - Especially if newly diagnosed or not meeting glycemic targets</td>
</tr>
<tr>
<td>Society for General Internal Medicine (Choosing Wisely Campaign)</td>
<td>NO</td>
</tr>
</tbody>
</table>

**Study Idea: “To Test or Not to Test?”**
SMBG Considerations

• Widely practiced in patients with diabetes conducted since 1980s

• Benefits well-established in Type 1 diabetes and Type 2 diabetes on insulin

• Glycemic Benefits of SMBG are minimal at best
  • Tests of simple SMBG A1c values reduces on average 0.2%
  • ‘Enhanced SMBG’ (patients/providers given education & feedback) reductions closer 0.5%
  • Thus patient and provider must be actively engaged

• SMBG may improve self-efficacy

• Potential Obstacles
  • Invasive, interrupts life
  • Cost
  • May increase depressive symptoms
OBJECTIVES

• Review and interpret findings from this study

• Apply findings to primary care patients with non-insulin treated type 2 diabetes

BACKGROUND

• Guidelines are inconsistent regarding the role of SMBG in adult patients with non-insulin treated type 2 diabetes

• Recommendations from health care providers vary widely

• Numerous stakeholders have an interest in this debate
Project Overview

450 PATIENTS with TYPE 2 DIABETES

After a year, there were no differences on average in blood sugar or quality of life

Study Population

- Primary care patients
- Age 30 and over
- English speaking
- Non pregnant
- Type 2 diabetes, not on insulin
- A1c 6.5%-9.5%
- 3 or less co-morbidities
**Intervention Details**

<table>
<thead>
<tr>
<th>Group 1</th>
<th>Group 2</th>
<th>Group 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>No SMBG Testing</td>
<td>Once daily SMBG Testing with standard patient</td>
<td>Once daily SMBG Testing with enhanced patient feedback</td>
</tr>
<tr>
<td></td>
<td><em>Feedback Glucose values reported on monitor</em></td>
<td><em>Glucose values reported on monitor plus a tailored feedback message delivered to the patient through the monitor</em></td>
</tr>
</tbody>
</table>
What are the results?

Over the course of one year, there were no clinically or statistically significant differences in glycemic control or quality of life between patients with non-insulin treated DM who perform SMBG compared to those who do not perform SMBG.

The addition of tailored feedback provided through messaging via a glucometer did not provide any advantage in glycemic control.
Secondary Outcomes

- No significant differences for
  - Problem Areas In Diabetes (PAID)
  - Diabetes Symptoms Checklist (DSC)
  - Diabetes Empowerment Scale (DES-SF)
  - Diabetes Treatment Satisfaction

- Communication Assessment Tool

- Summary of Diabetes Self-Care Activities was significant (but related to the blood sugar testing in arms)
Limitations

- Test of continuing monitoring rather than initiating monitoring
- Not all patients adhered to the group assigned; however, no difference in ITT and per-protocol analyses
- Patients belonged to one health care system
- Findings do not apply to patients on insulin
“Given the time and resource intensive nature of self-monitoring of blood glucose (SMBG), to test or not to test, is a critically important question facing the millions of patients living with non-insulin treated type 2 diabetes”

PCORI-funded Lead Researcher, Katrina Donahue, MD, MPH
APRIL REESE, MPH

Formerly - N.C. Department of Health and Human Services
Health Systems and Community Connections Unit Manager,
Community and Clinical Connections for Prevention and Health

Patient Advocate – Advisor to PCORI Study
Reactor Panel

Tony Hampton, MD, MBA, CPE
Family Practice Physician

Cheryl Larson
President & CEO, Midwest Business Group on Health
Re-examine Current Approach to Diabetes Management

Although unclear medical guidelines have led to a lack of consensus regarding the benefits of SMBG, employers should consider taking an informed approach to these findings by proactively reviewing their current type 2 diabetes health management approach.

Support Shared Decision-making

Dr. Donahue and her team is to move towards a more patient-centered approach where patients and providers discuss the pros and cons of SMBG. Employers can play a significant role in this process through workplace programs that educate employees and guide them in how to seek support from their provider.

Because the study population included patients with Type 2 Diabetes not using insulin, these results cannot be generalized to insulin users.
American Academy of Family Physicians reports on SMBG through Choosing Wisely

“SMBG testing has no benefit in patients with Type 2 Diabetes 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’ routines”.

Potential Impact

- 7 million people spared the inconvenience and pain
- $1,630 saved/ patient in testing
- 10 billion finger sticks avoided
- $12 billion saved in costs
- NO negative impact on health

Resources

PCORI Research Impact

https://www.pcori.org/impact/addressing-type-2-diabetes

Employer Toolkit: Diabetes Management in the Workplace

www.mbg.org/resources/employertoolkit

Tony Hampton, MD Website

www.drtonyhampton.com
There are more than 1000 research projects underway in the PCORI portfolio and over 180 that will have published results in 2018.
Non-drug Therapies Reduce Opioid Risks and Healthcare Costs

Can a Health Plan Initiative Mitigate Long-term Risks of Opioid Therapy?

Telehealth Video Calls are Helping Patients with Parkinson’s
Wrap up

Research Review

Type 2 Diabetes: Does Daily Self-Monitoring of Blood Glucose Improve A1c Levels and Quality of Life?

The Preventive Oncology Research Institute (PIORI) began funding research in 2012 and a growing number of the studies are non-protocol centered. Preventive research is an area where patients may find value in their healthcare planning and strategy.

The targeted research projects in this section focus on the value of self-monitoring of blood glucose (HbA1c) for patients with cancer to reduce treatment failure rates.

What’s the issue?
Many people with Type 2 Diabetes who are not on insulin use diet and exercise to manage their blood sugar levels. They may also use daily strips to measure their blood sugar levels with frequent results. But as A1c levels are sometimes painful, samples can be costly, and the health benefits have been unclear.

This study aims to determine if daily self-monitoring was effective for people with uncontrolled Type 2 Diabetes in helping them maintain blood glucose levels and reduce their quality of life.

Why Is This Important for Healthcare?
According to the Centers for Disease Control and Prevention, more than 29 million Americans live with diabetes, and 1 in 5 adults now has prediabetes. Now rampant in an epidemic, these two groups account for about 47 percent of the U.S. workforce.

The rising cost of diabetes is significant. The Health Care Cost Institute found that, for adults covered by employer-sponsored insurance, the spending difference between people with and without diabetes is more than $6,000 on average, with insulin costs reaching $600 billion annually.

Recognizing these devastating effects, determining best practices in treating people with diabetes is of obvious importance.

Available under resources on the National Alliance website: www.nationalalliancehealth.org

Give us Your Feedback

You will receive a survey link via email. Please complete by October 26, 2018.
THANK YOU

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• Neil Goldfarb, Greater Philadelphia Business Coalition on Health (Chair)
• Dr. David Asch, University of Pennsylvania
• Karen Van Caulil, Florida Health Care Coalition
• Jack Mahoney, Florida Health Care Coalition
• Bruce Sherman, Employers Health Coalition & Buck Consultants at Xerox
• Emma Hoo, Pacific Business Group on Health
• Pat Montoya, New Mexico Coalition on Healthcare Value
• Michael Thompson, National Alliance (Administrative Official)

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• Alyssa Barilotti, National Alliance (Project Assistant)