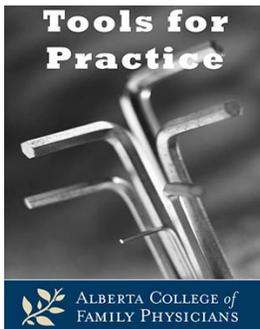


Tools for Practice is proudly sponsored by the Alberta College of Family Physicians (ACFP). ACFP is a provincial, professional voluntary organization, representing more than 4,400 family physicians, family medicine residents and medical students in Alberta. Established over sixty years ago, the ACFP strives for excellence in family practice through advocacy, continuing medical education and primary care research. www.acfp.ca

Reviewed: August 19, 2016
Evidence Updated: New evidence
Bottom Line: No change
First Published: June 15, 2009



Glucose Self-Monitoring in Type 2 Diabetics Not Using Insulin: Is it Bitter Sweet?

Clinical Question: What are the pros and cons of self-monitoring blood glucose for Type 2 diabetics not using insulin?

Bottom-line: Routine self-monitoring of blood glucose in Type 2 diabetics who do not use insulin has no clinical benefits, is not cost-effective, and may reduce quality of life.

Evidence:

- An individual-patient-level meta-analysis¹ of six Randomized Controlled Trials (RCTs) with 2,552 patients managing their Type 2 diabetes without insulin:
 - Mean HbA1c at baseline 8.3% (~1/4 had baseline HbA1c >9%).
 - Self-monitoring of blood glucose reduced HbA1c by:
 - 0.2% at six months.
 - 0.35% at one year.
 - This is below the minimum difference thought to be clinically important (>0.5%).²
- Systematic review³ of 12 RCTs (3,259 patients) also found:
 - No difference in:
 - Overall wellbeing or quality of life.
 - Symptomatic hypoglycemic episodes.
 - HbA1c reduced by 0.3%.
- RCT of 1,024 patients with median baseline HbA1c 7.3%
 - Self-monitoring blood glucose weekly lowered HbA1c by only 0.12% compared to monitoring twice yearly.
- Despite highly-motivated patients and intensive follow-up in these RCTs, only one-third to one-half of patients adhered to the self-monitoring protocol over 12 months.⁴⁻⁷

Context:

- Other systematic reviews^{8,9} and RCTs with more intensively-structured self-monitoring plans⁷ show similar, clinically insignificant differences.
- Trials thus far have been underpowered to evaluate the effect on clinical outcomes

- The achieved 0.2-0.35% HbA1c reduction would be expected to reduce clinical outcomes related to diabetes by a mere relative 3-8%.¹⁰
- Some RCTs^{6,11} and supporting studies¹² show worsening depressive symptoms^{6,12} and negative impact on quality of life^{11,12} with self-monitoring.
- Regular self-monitoring is not cost-effective.¹¹
- Eight public drug plans are spending \$247 million/year on test strips,¹³ so the total Canadian expenditure would be far more.
- While regular self-monitoring in Type 2 diabetics not on insulin appears unnecessary, this population should still know how to test their blood glucose in case they have symptoms of hypoglycemia, they are feeling ill, or they are interested in seeing the impacts of lifestyle behaviors.

Original Authors:

G. Michael Allan MD CCFP, Christina Korownyk MD CCFP

Updated:

Ricky D. Turgeon BSc(Pharm) ACPR PharmD

Reviewed:

G. Michael Allan MD CCFP

References:

1. Farmer AJ, Perera R, Ward A, *et al.* BMJ. 2012; 344:e486.
2. Type 2 diabetes mellitus, NICE guidelines. 2016. Available for download at: <https://www.nice.org.uk/advice/ktt12/chapter/evidence-context>. Last accessed: November 8, 2016.
3. Malanda UL, Welschen LMC, Riphagen II, *et al.* Cochrane Database Syst Rev. 2012; 1:CD005060.
4. Bosi E, Scavini M, Ceriello A, *et al.* Diabetes Care. 2013; 36:2887-94.
5. Farmer A, Wade A, Goyder E, *et al.* BMJ. 2007; 335:132-40.
6. O’Kane MJ, Bunting B, Copeland M, *et al.* BMJ. 2008; 336:1174-7.
7. Polonsky WH, Fisher L, Schikman CH, *et al.* Diabetes Care. 2011; 34:262-7.
8. Clar C, Barnard K, Cummins E, *et al.* Health Technol Assess. 2010; 14(12):1-140.
9. McIntosh B, Yu C, Lal A, *et al.* Open Medicine. 2010; 4:E102.
10. Stratton IM, Adler AI, Neil AW, *et al.* BMJ. 2000; 321:405-12.
11. Simon J, Gray A, Clarke P, *et al.* BMJ. 2008; 336:1177-80.
12. Franciosi M, Pellegrini F, De Berardis G, *et al.* Diabetes Care. 2001; 24:1870-7.
13. Cameron C, Virani A, Dean H, *et al.* Can J Diabetes. 2010; 34:34-40.

Tools for Practice is a biweekly article summarizing medical evidence with a focus on topical issues and practice modifying information. It is coordinated by G. Michael Allan, MD, CCFP and the content is written by practising family physicians who are joined occasionally by a health professional from another medical specialty or health discipline. Each article is peer-reviewed, ensuring it maintains a high standard of quality, accuracy, and academic integrity. If you are not a member of the ACFP and would like to receive the TFP emails, please sign up for the distribution list at <http://bit.ly/signupfortfp>. Archived articles are available on the ACFP website.

This communication reflects the opinion of the authors and does not necessarily mirror the perspective and policy of the Alberta College of Family Physicians.