

BEST PRACTICES IN: Pattern Management

A Tool to Empower Patients and Improve Glycemic Control

Background

Diabetes is the leading cause of kidney failure, non-traumatic lower limb amputations, and new cases of blindness. Diabetes is also a major cause of heart disease and stroke.¹ In 2012, more than 371 million people worldwide were estimated to suffer from diabetes, and the estimated global health care expenditures for prevention and treatment of diabetes were 471 billion US dollars.²

While the benefits of targeted glycemic control have been demonstrated for more than 2 decades, achieving the $\leq 7\%$ hemoglobin A1c (HbA1c) target set by the American Diabetes Association (ADA) continues to be difficult for patients.^{3,5} Self-monitoring of blood glucose (SMBG) is recommended by the ADA for all patients with diabetes³ and has been shown to be correlated with improved glycemic control.^{6,7} Yet SMBG adherence remains below expectations. A recent follow-up study of people with type 1 diabetes demonstrated that only 56% to 64% performed SMBG at least 4 times a day.⁸

The true value of SMBG cannot be realized unless the data are used to guide necessary changes. Pattern management is a systematic approach to reviewing SMBG data and deciphering trends that can guide behavioral (dietary and lifestyle) and therapeutic (insulin dose adjustments) changes to improve glycemic control. Pattern management can help patients and clinicians walk the tightrope of minimizing both hypo- and hyperglycemia. Evidence shows that hypoglycemia is a major limiting factor in achieving control of diabetes, and recurrent hyperglycemia can lead to a number of long-term complications.

Pattern management and barriers to its use

Although pattern management is widely embraced by health care professionals, implementation can be a challenge. Understanding and addressing the barriers to success begins with recognizing the patient's central role and the resultant critical need for patient engagement. Pattern management requires day-to-day collection, recording, and review of SMBG data. These data then inform whether immediate action may be needed—action that often should not wait until the next office visit. The patient's ability and confidence in self-management are critical for this to occur.

Lack of face time with health care providers. Today's abbreviated office visit poses a challenge to health care professionals as they try to use the opportunity to educate, engage, and empower.

Limited SMBG data. Patients often neglect to bring their logbooks or meters to the office visit. Without data to guide effective instructions and encourage learning in the context of the patient's own patterns, it is difficult for the health care professional to optimize care. Some patients may not maintain proper SMBG records. Patients who utilize multiple meters may not have the correct time programmed for each, making compilation of logbooks difficult.

Low adherence to SMBG. Poor glucose testing technique can make the process cumbersome, painful, or unsuccessful. Some patients complain that SMBG is too time-consuming or unnecessary. In one study, nearly 75% of 400 participants with diabetes agreed with the statement, "My body tells me without testing if my blood sugar is high or low."⁹ Others feel that their HbA1c provides their health care provider enough information to make therapy changes.⁹ Cost can be a limiting factor for some. Language barriers and health illiteracy may also impede successful SMBG.

The key to unlocking pattern management

Positive change. Improved glycemic control is an important motivator. Patients will not engage in SMBG and pattern management if nothing changes: when no action is taken, blood sugars remain the same and there is no incentive to continue monitoring. By taking every opportunity to review SMBG numbers with the patient—explaining what the data mean, pointing to the actions needed, and clarifying the rationale behind them—the health care professional can help patients learn to translate data into action and outcome.

Communication. Reviewing logbooks during office visits is essential. New patients may need to have contact with the office between visits to encourage education and review between visits via telephone, fax, or email can make a difference.

Sports and exercise. Sports and exercise are encouraged in all patients with diabetes. However, it is important to review with patients how exercise can impact blood glucose levels: the potential for hypoglycemia during the activity, the risk of immediate post-exercise hyperglycemia (given insulin dose adjustments pre-exercise or additional carbohydrate consumption to prevent lows), and the possibility of hypoglycemia in the overnight period. Data collection through SMBG is the first step, but assessment for patterns following exercise can ensure continued compliance with recommended physical activity.

One step at a time. Some people—such as those new to insulin, parents of young children with diabetes, or the elderly—may need more time to feel comfortable and confident making adjustments themselves. For many, pattern management may initially seem overwhelming. One solution is to help patients focus on one area at a time. For example, patients can be told to concentrate on a specific time of the day—eg, looking at just the bedtime numbers rather than reviewing the entire day's SMBG data, which can be overwhelming.

Adolescent population

The teenage years are filled with a struggle for independence along with the need for oversight from parents and guardians; diabetes adds another dimension to this dilemma. Parents often report worrying about their child's numbers, yet questions regarding blood glucose levels are often seen as accusations that the child is not meeting expectations. It is critical in this group to discuss the importance of being a team that comprises the patient, the parents, and the health care provider. Scheduling weekly check-ins may allow parents and teens to discuss diabetes without having the conversation deteriorate to a debate. For example, families can pick a favorite television show to watch together and use the commercial break to record numbers as a team. Alternatively, parent and child could use this time to download meters or pumps, print files, and identify patterns. This team approach has been successful in improving not only glycemic control but also parent-child dynamics and mutual trust. It also lays the groundwork for good lifelong care.

Looking ahead

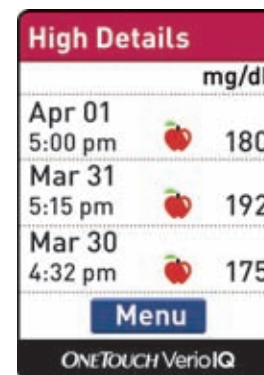
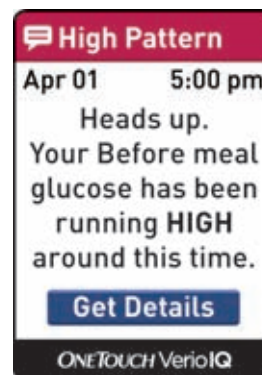
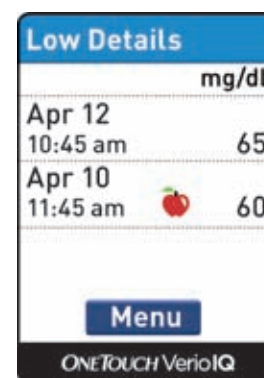
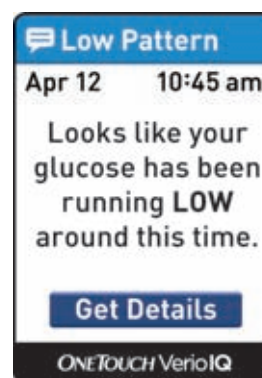
New technologies can make pattern management easier and more accessible. The OneTouch® Verio® IQ System with PatternAlert™ Technology, introduced by LifeScan in 2012, helps in pattern recognition and prompts patients to take action. It displays patterns of highs and lows on the screen with messages. (See OneTouch® Verio® IQ screenshots above.) This enables patients and their health care professionals to



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more easily recognize the issue and take corrective action. Default high and low settings are based on ADA guidelines.

Other technologies (software, websites) are also available to simplify the process of capturing and analyzing SMBG data and identifying and visualizing trends to make it easier for patients to understand and take action. New technologies notwithstanding, help for the millions of patients suffering from diabetes begins with education and empowerment, to which their health care providers hold the key.

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References

- Centers for Disease Control and Prevention. *National diabetes fact sheet: national estimates and general information on diabetes and prediabetes in the United States, 2011*. Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, 2011.
- International Diabetes Federation. *IDF Diabetes Atlas, 5th edition, 2012 update*. <http://www.idf.org/diabetesatlas/5e/Update2012>. Accessed February 11, 2013.
- American Diabetes Association. Standards of medical care in diabetes—2013. *Diabetes Care*. 2013;36(Suppl 1):S11-66.
- Saydah SH, Fradkin J, Cowie CC. Poor control of risk factors for vascular disease among adults with previously diagnosed diabetes. *JAMA*. 2004;291(3):335-342.
- Hoerger TJ, Segel JE, Gregg EW, Saaddine JB. Is glycemic control improving in U.S. adults? *Diabetes Care*. 2008;31(1):81-86.
- Karter AJ, Parker MM, Moffet HH, et al. Longitudinal study of new and prevalent use of self-monitoring of blood glucose. *Diabetes Care*. 2006;29(8):1757-1763.
- Miller KM, Beck RW, Bergenstal RM, et al; the T1D Exchange Clinic Network. Evidence of a strong association between frequency of self-monitoring of blood glucose and hemoglobin A1C levels in T1D Exchange Clinic Registry participants [published online ahead of print February 1, 2013]. *Diabetes Care*.
- Nathan DM, Zinman B, Cleary PA, et al; Diabetes Control and Complications Trial/Epidemiology of Diabetes Interventions and Complications (DCCT/EDIC) Research Group. Modern-day clinical course of type 1 diabetes mellitus after 30 years' duration: the diabetes control and complications trial/epidemiology of diabetes interventions and complications and Pittsburgh epidemiology of diabetes complications experience (1983-2005). *Arch Intern Med*. 2009;169(14):1307-1316.
- Fisher WA, Kohut T, Schachner H, Stenger P. Understanding self-monitoring of blood glucose among individuals with type 1 and type 2 diabetes: an information-motivation-behavioral skills analysis. *Diabetes Educ*. 2011;37(1):85-94.

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