Pattern Management in Diabetes

Raylene Foster MS,CDE

This presentation is made at the request of the planning committee. The presenter, Raylene Foster, although an employee of Novo Nordisk Inc., is presenting in his/her own behalf. The opinions expressed and any views expressed during the presentation are those of the presenter and may not be attributed to Novo Nordisk Inc.

What is pattern management?

• Pattern management is a systematic approach designed to help patients with diabetes identify patterns in their blood glucose readings
• The patterns can then be used to determine if changes are needed to optimize blood glucose control


Why is pattern management important?

• Achieving and maintaining blood glucose goals are crucial for reducing the risk of complications in patients with type 1 or type 2 diabetes


The benefits of pattern management

• Pattern management may be associated with improved patient outcomes, including:
  - Reduced A1C levels
  - Lower incidence of hypoglycemia
  - Prediction of severe hypoglycemia


More about the benefits of pattern management

• Pattern management can also help increase patient confidence in diabetes self-management
  - The self-confidence of patients results from understanding how their blood glucose data compare with their target goals and knowing if and when they should make changes in their food choice, physical activity, or medication
  - Structured self-monitoring of blood glucose has been found to significantly improve glycemic control by facilitating timely and effective treatment changes


More about the benefits of pattern management

• Unlike A1C, which provides a long-term perspective on diabetes management, pattern management can be used to analyze daily and intra-daily glucose fluctuations and guide treatment on a daily basis
• The information that patients gain through pattern management can help motivate them to take additional steps to improve their self-care
Pattern management and effective insulin management

- Pattern management is an essential component of effective insulin management because it:
  - Educates patients about how well controlled their blood glucose levels are
  - Provides feedback about treatment and guides subsequent treatment changes
  - Helps minimize the number of high and low blood glucose readings, leading to more stable glucose levels
  - Helps patients become involved partners with their diabetes care teams


The pattern management process

- The pattern management process entails:
  - Self-monitoring of blood glucose and recognizing glucose patterns
  - Analyzing what is causing out-of-target readings
  - Taking steps to return readings back to the target range


More about the pattern management process

- Pattern management provides patients with information to make decisions about their diabetes self-management. This information:
  - Enables patients to understand how their daily choices affect their blood glucose levels
  - Helps empower patients to take the necessary steps to reach their goals

Pattern management empowers patients to take action and advocate for improving their own diabetes care.


Managing patterns

- Although advances in insulin therapy and the availability of more effective strips to test blood glucose are central to diabetes management, a key element is for providers to teach, and for patients to engage in, self-management practices such as pattern management
  - The more advanced an insulin regimen is, the more important it is that pattern management is a component of that regimen


Starting the pattern management dialogue

- Pattern management fosters dialogue between patient and provider focused on fine-tuning the patient’s care plan
  - You can begin that dialogue by saying to the patient:

  “This information will help you and your care team learn the full story about how your body is living with diabetes. By looking at the patterns of your blood sugar at the same time over a few days, you and your care team will have additional insights that can help you adjust your care plan as needed to help you reach your goal.”

Practicing pattern management

- A pattern is a series of blood glucose readings that are taken at the same time each day and that are above, below, or within the patient’s target range
  - The patient should be instructed to look for a pattern over several consecutive days

More about practicing pattern management

- If a pattern is observed at a certain time of day, the patient may need to do one or more of the following to improve his or her blood glucose control:
  - Evaluate and address the effect of his or her:
    - Carbohydrate intake
    - Physical activity
    - Illness
    - Stress
    - Hormones
    - Daily schedule
  - Adjust his or her medicine dose

Pattern management: an example

- After monitoring her blood glucose for a few days, it becomes apparent that Sally has high blood glucose every morning but seems to be within target range after her meals
- This is an opportunity to review with Sally her basal insulin routine, evening meal patterns, and recent schedule changes and life events
- It is also important to determine if she has any signs of hypoglycemia in the middle of the night

The 5 basic steps of pattern management

1. Know the target blood glucose range (both premeal and postmeal targets should be established)
2. Gather needed data: blood glucose levels, carbohydrate grams per meal, insulin doses, activity levels, schedule, and physical and emotional stress
3. Look for patterns
4. Assess factors that may be influencing the patterns
5. Take action

Pattern management and adjusting insulin

- Pattern management focuses on correcting an undesirable pattern
- Blood glucose readings, or a pattern of readings, are a reflection of insulin taken in the past
- If an insulin dose adjustment is called for, the adjustment needs to be made in the insulin dose that was taken before the time of the pattern
  - For example, bedtime blood glucose readings reflect the action of fast-acting insulin taken before the evening meal

Using Pattern Management with your patients

- BG data with log notes
- CGM data with log notes

Tools for pattern detection and management

- Patterns are not always easy to detect or interpret, but there are tools available that can help patients and their health care providers perform this task
- These tools help patients document their blood glucose levels as well as factors that may affect their blood glucose, such as carbohydrate intake, medication use, physical activity, and psychological factors like stress
The 3-Day Blood Sugar Tracker
• The 3-Day Blood Sugar Tracker

More about the 3-Day Blood Sugar Tracker
• The 3-Day Blood Sugar Tracker is designed to help your patients:
  – Detect patterns based on their blood glucose readings over a 3-day period
  – See firsthand how their blood glucose levels can be affected by certain foods, physical activity, stress, and medicine
  – Make medicine and behavioral changes based on the patterns detected to enhance blood glucose control
  – Work closely with you to set goals and meet them

The requirements of pattern management
• In addition to an effective pattern detection tool, successful pattern management requires education and commitment from both patient and health care provider in order to:
  – Gather, review, and interpret self-monitoring of blood glucose values
  – Make insulin dose changes based on the patterns detected

Cause and Effect
• Basal Amount or Timing
• Bolus Amount or Timing
• Food Amount, Type, Timing
• Other Factors

Evaluating Patterns

- Overnight
- Fasting
- Pre-meal
- Post-meal

Checking Basal: Fasting Method: 8 hour time buckets

Daytime Basal: Fasting Method

**GOAL:** BG to stay within target through skipped mealtime

**Evaluation Guidelines:**
- Divide day into segments
  - Pre-breakfast to pre-lunch
  - Pre-lunch to pre-dinner
  - Pre-dinner to bedtime
- Evaluate hourly BGs across skipped mealtime
- Identify rise/fall pattern

Patient:
- Choose day when BG is in a safe range
- Skip one meal
- Check BG hourly
- Normal routine

Post-meal BG/CGM

2 Key Concepts

1. **Post-meal BGs should be ~ 30 to 60 mg/dl higher than pre-meal BG**
   - Since digestion of most meals typically is still occurring at the 2-hour post-meal BG check, and...
   - The 2-hour post-meal BG should be ~30-60mg/dL higher than its corresponding pre-meal BG

2. Then, the 2-hour post-meal BG should steadily decline and be back within pre-meal target range by next pre-meal
**Insulin Dose Adjustments**

When to make adjustments:
- **Hyperglycemia**
  - Consider adjusting if BG readings show consistent pattern of highs 2 to 3 days in a row
- **Hypoglycemia**
  - Consider adjusting if even one low occurs
    - Hypoglycemia and the treatment of hypoglycemia, disrupts BG patterns
    - Avoiding lows during the adjustment phase makes fine tuning faster and easier

**Addressing the barriers to pattern management**

- For a variety of emotional and psychological reasons, some patients, even after being trained, may find it hard to carry out the recommended pattern management tasks, such as measuring their blood glucose frequently or adjusting their insulin dose in response to the blood glucose patterns
- Motivational interviewing may help patients address and overcome the barriers to pattern management

**What is motivational interviewing?**

- Motivational interviewing (MI) may help encourage patients to self-monitor their blood glucose and recognize patterns
- Motivational interviewing (MI) is a gentle but effective style of patient counseling that empowers patients to overcome poor motivation, identify and change problematic behaviors, and take an active role in their own health care
- MI is a collaborative approach; the health care provider does not assume an “expert” role
- The patient’s perspective and autonomy are respected at all times

**How does motivational interviewing work?**

- MI revolves around the following key concepts:
  - Ask
  - Reflect
  - Affirm
  - Summarize

- At the core of MI is the belief that the answers are within the patient

**Key Concepts In Diabetes Care To Review with your Patients**

- Why pattern management is important
- Factors that impact overall patterns
- Partnership to solve patterns

**How foods affect blood glucose**

**Carbs**
- Carbs affect blood glucose significantly
- Blood glucose levels rise higher and faster (1-2 hours)

**Fats**
- Fats do not affect blood glucose significantly
- Blood glucose levels take a longer time to rise

**Protein**
- Protein does not impact blood glucose significantly
- Blood glucose levels take a longer time to rise
How foods affect blood glucose (cont’d)

Understanding carbohydrates
Group Health Cooperative website.

How insulin works
• Injected insulin lowers blood glucose levels by helping glucose move from the blood into the body’s cells
• When glucose gets inside the cells, it provides energy to the body

Understanding insulin action

Onset, peak, and duration of the different types of insulin

Insulin stacking: why it can be dangerous
• Insulin stacking is the practice of giving additional insulin before the scheduled dose or before the previous dose has finished working
  – Insulin doses are injected at times close to one another, resulting in an overlap of action of the insulin
• Insulin stacking is one of the most common causes of hypoglycemia
• Insulin stacking is an issue for bolus insulin

2. Treated with intensive insulin. Diabetes Teaching Center at the University of California, San Francisco website.
Other factors that can affect blood glucose

• It is important to increase awareness among patients of other things that they can do, in addition to taking medication, to help improve their blood glucose control, such as:

Moderate-intensity aerobic physical activity
(at least 30 minutes a day, 5 days a week)

Reducing or eliminating stress and anxiety, which can adversely affect diabetes self-management and health outcomes

Insulin Dose Adjustments

Adjusting settings is a logical, systematic process:

– The glucose lowering effect of rapid-acting insulin is predictable
– Basal insulin should cover hepatic glucose production
– Bolus insulin should cover food intake & high BGs

Note: With all insulin regimens, making adjustments to settings is an ongoing process. Glucose readings and evaluation of a patient's glycemic control should be reviewed at every visit

Questions?

Thank you