

OPPORTUNITIES TO MINIMIZE THE RISK OF HYPOGLYCEMIA IN PATIENTS WITH TYPE 2 DIABETES (T2D)

Hypoglycemia is a challenge in managing patients with T2D

Although patients with type 2 diabetes (T2D) are often perceived to be at lower risk for hypoglycemia than patients with type 1 diabetes, it is a common—and potentially severe—adverse effect of some antidiabetic treatments, including sulfonylureas, glinides, and insulin.¹⁻⁵ Hypoglycemia adversely affects quality of life, treatment satisfaction, and medication adherence, which in turn can impact the patient’s overall health.^{1,6,7}

Important Considerations

Hypoglycemia can be difficult to identify^{1-3,8}

- Some patients do not experience symptoms, so an episode of hypoglycemia may go unnoticed unless caught by routine self-monitoring of blood glucose. If symptoms are recognized, they may not be remembered or reported to the healthcare professional (HCP)^{2,3}
- HCPs can educate their T2D patients about the signs and symptoms of hypoglycemia and provide coping tools²⁻⁴

There are multiple risk factors for hypoglycemia

- Patients with T2D of longer duration are at increased risk for hypoglycemia^{2,4,6,8}
- Other risk factors include advancing age, multiple comorbidities and complications, renal impairment, depression, unawareness of hypoglycemic symptoms, polypharmacy, and recent hospitalization^{4,6,8,9}
 - In older adults, the ability to perform self-care may be compromised by some of these complicating factors⁹
- Tight glucose control may increase the risk of hypoglycemia, particularly in an inpatient setting^{2,6,10,11}

Hypoglycemia can affect medication adherence^{1,6,7}

- Adverse events and tolerability issues such as hypoglycemia can result in patients reducing adherence, or switching or quitting treatments^{6,7}
- Fear of future episodes can cause patients to change self-management behaviors, which could result in suboptimal glycemic management^{1,10}

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Hypoglycemia was significantly associated with an increased likelihood of medication non-adherence and reduced treatment satisfaction⁷
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Quality of life and health status can be adversely affected^{6,7,10,12}

- Hypoglycemia affects cognitive function and mood, and can cause physical symptoms such as headaches; sweating; shakiness; weakness; lack of coordination; and feeling faint, dizzy, or light-headed^{7,8}
- Hypoglycemia is associated with increased healthcare use, including hospitalization and emergency department visits¹²

Hypoglycemia results in longer hospital stays and increased costs^{11,12}

- Patients admitted to the hospital with diabetes who had an inpatient hypoglycemic episode had:
 - **Longer** stays (mean, 11.7 vs 5.1 days)
 - **7% higher** risk of inpatient mortality
 - **39% increase** in hospital costs
 - **58% increase** in the likelihood of being discharged to a skilled nursing facility

Steps to Minimize the Risks of Hypoglycemia

- When selecting antihyperglycemic medication, minimization of the risk and severity of hypoglycemia should be a goal^{1,2,6}
- Balance the glucose-lowering efficacy of an agent against its potential to increase the risk of hypoglycemia⁶
- Implement surveillance and treatment protocols in long-term care facilities⁴
- Monitor hospitalized patients with T2D for hypoglycemia, paying close attention to matching the antihyperglycemic regimen to nutritional intake¹¹
- Simplify complex regimens for patients and caregivers, particularly for older patients or patients whose cognition may be impaired⁴
- Assess patients for hypoglycemia at every office visit, particularly those taking insulin and insulin secretagogues. A sample questionnaire appears at the end of this brochure⁴
- Educate patients and caregivers about the signs and treatment of hypoglycemia to help minimize the risks^{2,4}
- Recognize and address hypoglycemia as a tolerability issue to decrease its bothersome effect on patients and promote treatment satisfaction and improved medication adherence^{6,7}

The sample hypoglycemia questionnaire on the next page can be used to assess hypoglycemia risk for patients with T2D being treated with insulin or other oral antidiabetes drugs. Patients can complete this questionnaire while in the waiting room at the beginning of every visit. You can make additional copies as needed.

References: **1.** Zhang Y, Wieffer H, Modha R, et al. The burden of hypoglycemia in type 2 diabetes: a systematic review of patient and economic perspectives. *JCOM*. 2012;17(12):547-557. **2.** The Endocrine Society. Evaluation and management of adult hypoglycemic disorders: an Endocrine Society clinical practice guideline. *J Clin Endocrinol Metab*. 2009;94(3):709-728. **3.** Zammitt NN, Frier BM. Hypoglycemia in type 2 diabetes: Pathophysiology, frequency, and effects of different treatment modalities. *Diab Care*. 2005;28(12):2948-2961. **4.** Seaquist ER, Anderson J, Childs B, et al. Hypoglycemia and diabetes: a report of a workgroup of the American Diabetes Association and The Endocrine Society. *J Clin Endocrinol Metab*. 2013;98(5):1845-1859. **5.** Bennett WL, Wilson LM, Bolen S, et al. Oral Diabetes Medications for Adults With Type 2 Diabetes: An Update. Comparative Effectiveness Review No. 27. (Prepared by Johns Hopkins University Evidence-based Practice Center under Contract No. 290-02-0018.) AHRQ Publication No. 11-EHC038-EF. Rockville, MD: Agency for Healthcare Research and Quality. March 2011. www.ncbi.nlm.nih.gov/books/NBK55754/. Accessed April 19, 2016. **6.** Bron M, Marynchenko M, Yang H, et al. Hypoglycemia, treatment discontinuation, and costs in patients with type 2 diabetes mellitus on oral antidiabetes drugs. *Postgrad Med*. 2012;124(1):124-132. **7.** Pollack MF, Purayidathil FW, Bolge SC, Williams SA. Patient-reported tolerability issues with oral antidiabetic agents: associations with adherence; treatment satisfaction and health-related quality of life. *Diab Res Clin Pract*. 2010;87(2):204-210. **8.** Frier BM, Heller SR. Epidemiology and impact of hypoglycemia on patients with diabetes. In: Hypoglycemia in diabetes update. Robertson PR, Seaquist ER, eds. *Translat Endo Metabol*. 2012;3(4):15-46. **9.** Munshi MN, Segal AR, Suhl E, et al. Assessment of barriers to improve diabetes management in older adults. *Diab Care*. 2013;36(3):543-549. **10.** Williams SA, Shi L, Breneman SK, et al. The burden of hypoglycemia on healthcare utilization, costs, and quality of life among type 2 diabetes mellitus patients. *J Diab Complications*. 2012;26(5):399-406. **11.** Turchin A, Matheny ME, Shubina M, et al. Hypoglycemia and clinical outcomes in patients with diabetes hospitalized in the general ward. *Diab Care*. 2009;32(7):1153-1157. **12.** Curkendall SM, Natoli JL, Alexander CM, et al. Economic and clinical impact of inpatient diabetic hypoglycemia. *Endo Pract*. 2009;15(4):302-312.

Hypoglycemia Questionnaire for Patients With Type 2 Diabetes

1. How often can you tell by your symptoms that your blood sugar (glucose) is low? *(Check one)*

Never Rarely Sometimes Often Always

2. What are your usual symptoms of low blood sugar?

Headache Sweating Shakiness/trembling Weakness Lack of coordination

Faintness Dizziness or lightheadedness Other *(list)* _____

3. In a typical week, how many times will your blood sugar go below 70 mg/dL? _____ times a week

4. When your blood sugar goes below 70 mg/dL, what is the usual reason for this?

5. How many times have you had a severe hypoglycemic episode where you needed someone's help and were not able to treat yourself?

Since your last visit: _____ times In the last year: _____ times *(Please answer both)*

6. How many times have you had a moderate hypoglycemic episode where you could not think clearly, properly control your body, had to stop what you were doing, but you were still able to treat yourself?

Since your last visit: _____ times In the last year: _____ times *(Please answer both)*

7. How often do you carry a snack or glucose tablets or gel with you to treat low blood sugar?
(Check one)

Never Rarely Sometimes Often Almost always Always

Hypoglycemia Questionnaire for Patients With Type 2 Diabetes (cont'd)

8. How low does your blood glucose get before you think you should treat it?

Less than _____ mg/dL

9. What food or drink do you usually use to treat low blood sugar?

How much? _____

10. Do you check your blood sugar before driving? (Check one)

Yes, always Yes, sometimes No

11. How low does your blood sugar need to go before you think you should not drive?

Less than _____ mg/dL

12. If you take insulin, do you have a glucagon emergency kit? (Check one)

Yes No

13. Does a spouse, relative, or another person close to you know how to administer glucagon?

(Check one) Yes No