



Diabetes Center of Excellence Hypoglycemia Emergency Preparedness Project

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■ **IN BRIEF** “Quality Improvement Success Stories” are published by the American Diabetes Association in collaboration with the American College of Physicians, Inc., and the National Diabetes Education Program. This series is intended to highlight best practices and strategies from programs and clinics that have successfully improved the quality of care for people with diabetes or related conditions. Each article in the series is reviewed and follows a standard format developed by the editors of *Clinical Diabetes*. The following article describes a successful effort to ensure that patients who are at risk for severe hypoglycemic events have a viable glucagon emergency plan in place.

Describe your practice setting and location.

The Diabetes Center of Excellence (DCOE) is a U.S. Air Force diabetes specialty clinic located at Joint Base San Antonio, in Lackland, Tex. Its patients are Department of Defense (DoD) beneficiaries, including individuals who are on active duty or retired and their dependents. The DCOE embraces a multidisciplinary approach in which several individuals interact with patients at each encounter (1).

Describe the specific quality gap addressed through the initiative.

Our team chose to assess whether our patients who are at risk for severe hypoglycemic events had an emergency plan in place consisting of a current prescription for glucagon, availability of the glucagon, and someone trained to administer it if the need arose.

How did you identify this quality gap? In other words, where did you get your baseline data?

The patients targeted were all patients with type 1 diabetes using either an

insulin pump or multiple daily injection insulin therapy or patients with type 2 diabetes using insulin pumps. Patients were identified each day before their scheduled clinic appointments and were provided with a short questionnaire by licensed vocational nurses (LVNs) during the screening process. This form was then given to the providers for review. If needed, the provider wrote a glucagon prescription and gave patients verbal and written instructions on its use.

The questionnaire included the following questions:

- Do you have glucagon in your home? Yes or No
- Is it expired? Yes, No, or Don't Know
- Have you had a hypoglycemic event that required assistance? Yes or No
- Who was taught to use glucagon? You, Family Member, Other, No One

Initial data were collected for 3 months in 2013. The providers were required to complete the bottom of the questionnaire answering the following questions:

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FIGURE 1. Four steps in tracking glucagon prescriptions using the DCOE's EMR *NoteWriter* dashboard.

- Did you review this form?
- Did you order glucagon?

This process was repeated in 2015 for 7 months to determine whether the improvements made as a result of the project had been sustained. The same target population was used.

Summarize the initial data for your practice (before the improvement initiative).

Data were collected on 218 patients during 3 months in 2013. Baseline data revealed that 162 patients (74.3%) had glucagon in their home; however, only 84 of those patients (52.0%) reported it to be in date (i.e., not expired). In addition, 23 patients (10.5%) reported that no one knew how to use the glucagon kit. A total of 111 patients (50.9%) reported that their family members knew how to use the kit, and 144 patients (66.1%) reported knowing how to use the kit themselves.

What was the timeframe from initiation of your quality improvement (QI) initiative to its completion?

This QI project began in May 2013; follow-up data were collected in

2015. An intervention was put in place to sustain initial gains.

Describe your core QI team. Who served as project leader, and why was this person selected? Who else served on the team?

One of our certified diabetes educators (CDEs) served as project lead. Our team included our LVNs, CDEs, providers (including fellows), and the research director.

Describe the structural changes you made to your practice through this initiative.

An addition to the patient files now tracks all patients identified as using an intensive insulin regimen, which places them at risk for severe hypoglycemia. A note in the electronic medical record (EMR) prompts staff (LVNs, CDEs, and providers) to address the need for initiating or renewing glucagon prescriptions, generating or updating the emergency plan, and educating the patient's friends or family members on how to administer glucagon in the event of a severe hypoglycemic reaction (Figure 1). If a patient's glucagon was dispensed more than 1 year ago, the pink box

appears on the dashboard to remind the provider to prescribe a new glucagon kit. The provider checks the box when the glucagon is ordered, which automatically updates the "Glucagon Dispensed" date in the record.

Additionally, a patient handout was developed to facilitate training and for patients' home reference. This handout is distributed by providers and CDEs to patients new to insulin and to those found to need education about severe hypoglycemic events.

Glucagon training kits were obtained from both Eli Lilly and Company and Novo Nordisk for training patients in the clinic. We also share a free phone app called "Glucagon," which was created by Eli Lilly and Company and provides virtual training on how to administer glucagon and a reminder system to alert patients about an approaching expiration date on their glucagon kit.

Detailed information about this QI project has been previously published (2).

Describe the most important changes you made to your process of care delivery.

Through our EMR system's *NoteWriter* dashboard, providers receive an alert

concerning a patient's high risk for severe hypoglycemic events and another alert if more than 1 year has passed since a patient was last prescribed glucagon (Figure 1).

A patient handout provides clear information on the need for and proper use of a glucagon kit. Typically, CDEs educate patients who are at risk for severe hypoglycemic events at a clinic visit using the handout, which the patient then takes home for reference. In addition, CDEs introduce the Eli Lilly and Company Glucagon app as a potential resource for patients.

Summarize your final outcome data (at the end of the improvement initiative) and how it compared to your baseline data.

- Only 3 of 200 patients (1.5%) in 2015 reported that no one in their home knew how to use glucagon, compared to 23 patients (10.5%) in 2013.

- The percentage of patients reporting that family members are trained to administer glucagon increased significantly from 50.8% (111 patients) in 2013 to 79.7% (159 patients) in 2015.
- The percentage of patients reporting that they were educated in glucagon administration also significantly increased from 66.2% (144 patients) to 83.2% (166 patients).

What are your next steps?

We continue to engage patients in conversations about the importance of having an emergency glucagon kit.

What lessons did you learn through your QI process that you would like to share with others?

A multidisciplinary approach was crucial to the success of this project. It is better for a patient to be asked about glucagon several times than not to be asked at all. Upon implementation of the project, we realized we had not

considered some relevant cost-related issues. Within the DoD, medications are predominantly provided by military treatment facility pharmacies. These pharmacies maintain an inventory based on past and present utilization and budget accordingly. We neglected to inform our pharmacy about our project, and as a result, the supply of glucagon was quickly depleted, which brought about an unexpected increase in costs to the facility. Clear communication before implementing the program could have avoided this issue.

Duality of Interest

No potential conflicts of interest relevant to this article were reported.

References

1. Sauerwein TJ, True MW. The Diabetes Center of Excellence: a model to emulate. *Mil Med* 2016;181:407–409
2. Cobb E, Watson N, Wardian J, Morrow C, Sauerwein T. Glucagon kits: are your patients prepared for a hypoglycemic emergency? *AADE in Practice* 2017;5:12–17