



Process improvements and teamwork reduce hypoglycemic events

Improving hypoglycemia recheck timeliness prevents adverse events for
Northwestern Medicine Lake Forest Hospital

In 2019, Northwestern Medicine Lake Forest Hospital recognized an opportunity to improve the timeliness of repeat point-of-care (POC) blood glucose (BG) testing following hypoglycemic events (POC BG < 70mg/dL). The percentage of repeat POC BG testing done within 15–30 minutes of an event was 33% for their pilot unit — significantly lower than the 75% rate of performance

published by another institution in 2017. Targeting a recheck time between 15–30 minutes is ideal, as it accounts for the time potentially needed to administer treatment as well as for the patient to absorb it. Improving this metric was a major goal of the hospital's quality improvement team, since hypoglycemia is associated with adverse outcomes, including death.

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Lake Forest Hospital's quality improvement (QI) team recognized the opportunity to improve and joined a Vizient Learning and Action Network collaborative focused on patient safety. The team, led by Shannon Hale, performance improvement program director, developed a project charter and focused its efforts on one patient unit as a pilot for what they hoped could ultimately extend across their entire hospital system. The team's goal was to increase the frequency of hypoglycemia rechecks within 15–30 minutes on the pilot unit from 33% to 75% among hospitalized patients (inpatient and observation) aged 18 or older by the end of fiscal year 2020.

A team approach

Lake Forest Hospital's QI team implemented a proven quality improvement methodology, known as DMAIC (define, measure, analyze, improve, control), which began with tracking glucometric data in Northwestern Medicine's enterprise data warehouse. This revealed an area of opportunity in the timeliness of hypoglycemia rechecks at their hospital — this workflow was also considered a good candidate for process improvement due to its narrow scope and measurability.

The QI team then partnered with nursing leadership, who supported this initiative and facilitated the development of a strong working relationship with the pilot unit's nursing team. Starting in November 2019, the QI team "went to Gemba" to perform observations on multiple nursing units, interviewed numerous staff members and held focus groups with the pilot

Lessons learned

Northwestern's QI team recommends the following approach for achieving similar results with a targeted quality improvement project:

Start with data

Northwestern leveraged its analytics resources to develop glucometrics, which enabled the QI team to identify this area of opportunity.

Involve staff to gather feedback and ideas

It is essential to have "the voice of the customer." From the start, Northwestern's QI team partnered with nursing leadership and staff of its pilot unit to facilitate early buy-in and sustainable improvement.

Apply proven QI methodology

Northwestern used many established tools, along with the education and methodology of Vizient's collaborative process, to systematically approach quality improvement.

Hardwire changes to facilitate sustainability and spread

After achieving success through a manual process that relied on staff setting timers, Northwestern is now automating the process within its EMR.



Above: Pictured is the team that drove improvement. From left: **Rohangiz Ayrempour**, MSN, RN, RN-BC, Nurse Manager, Medical/Oncology D2, **Alice Jacob**, MD, Internal Medicine/Hospitalist, **Anthony Pick**, MD, CDE, ABOM, Director of Endocrinology, LFH, **Simona Balu**, MD, Internal Medicine/Hospitalist, **Brandon Daley**, MD, Clinical Quality Leader, **Rachelle Dizon**, BSN, RN, CMSRN, Clinical Practice Specialist, and **Christy Martinez**, BSN, RN, CMSRN, Clinical Practice Specialist.

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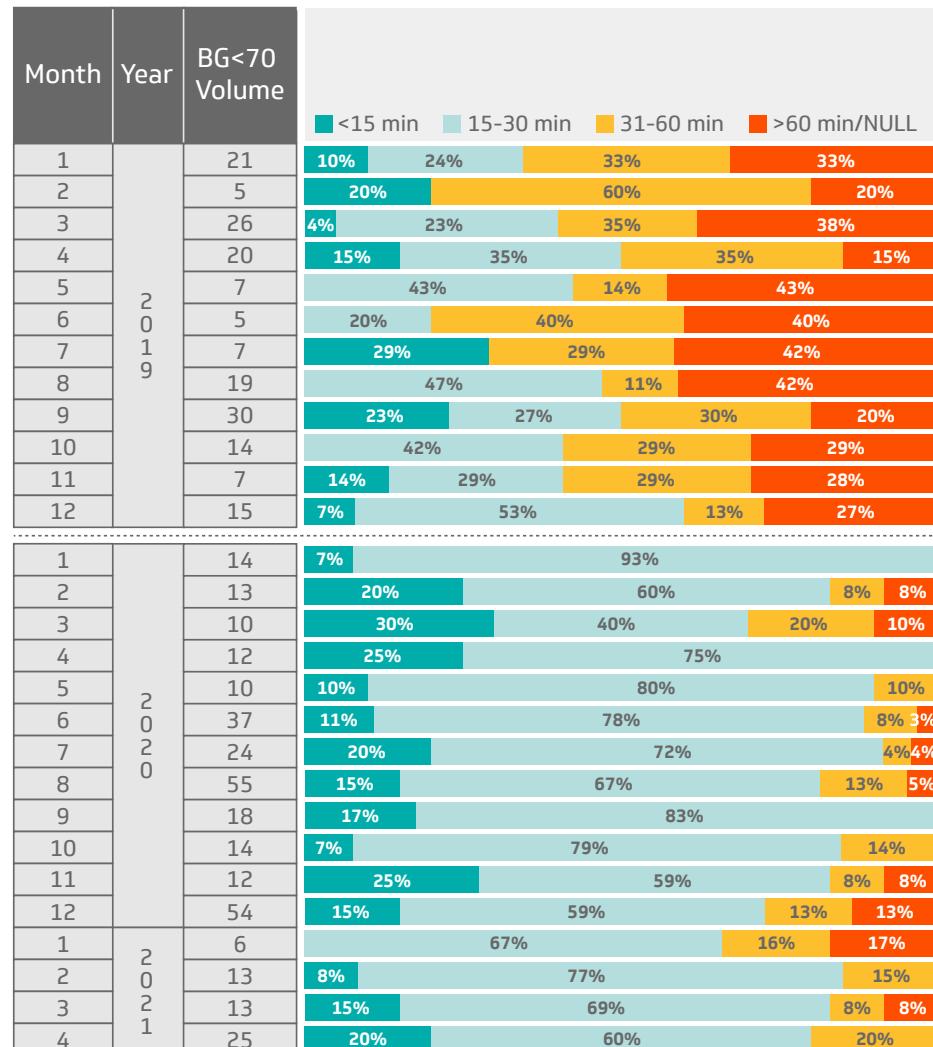


unit's staff. Using this information, the QI team constructed a process map that identified timekeeping as a key vulnerability; there was no mechanism in place to remind staff to return to recheck the blood glucose.

The pilot unit's nurses and techs proposed setting timers on their own mobile devices, which began in late December 2019. The QI team concurrently provided handouts on hypoglycemia, informally educated the staff and created a paper-and-pencil log for staff to document their barriers to rechecking the blood glucose levels. After six months, the QI team surveyed the pilot unit's staff. Timers, followed by education, were voted as the most effective interventions. Roughly 90% of the staff also voted in favor of creating a worklist task within the electronic medical record (EMR) for hypoglycemic events, as well as implementing the hypoglycemia log when spreading the initiative to other nursing units.

To facilitate sustainability and adoption rates, the QI team recently automated aspects of their interventions via Northwestern Medicine's EMR. These enhancements included sending active alerts via push notification to the staff's mobile EMR devices 15 minutes after hypoglycemic events (launched February 2021) as well as passive EMR alerts that enhanced the hypoglycemia documentation workflow (launched December 2020).

Repeat Blood Glucose Testing Improvements



Quantifying improvements

Starting in January 2020, the improvement for the pilot unit was dramatic (see chart above). The percentage of repeat POC BG testing performed within 15–30 minutes after a hypoglycemic event increased from 33% in 2019 to 70% in 2020. The improvement has sustained throughout 2021.

"The process opened everyone's eyes that we had opportunities for improvement. The fact that the changes weren't done in a vacuum — and involved staff — helped us to change practices quickly and immediately improve patient care."

Simona Balu, MD

Hospitalist, Northwestern Medicine Lake Forest Hospital

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