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The role of nursing in treating hypoglycemia in the hospital

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Introduction:

there is an emergency standing order (ESO) in place for the presentation of hypoglycemia in the clinical setting. According to the policy paper, when patients present with urgent care, the ESO's job is to direct registered nurses (RNs) to execute specific steps; delaying treatment could put the patient's health in even greater jeopardy (Ascension St. Vincent's, 2020). This order set is only available to adult patients. Following treatment, the registered nurse (RN) is required to alert the healthcare provider as soon as feasible. The RN will also need to obtain instructions to support the actions from the protocols while carrying out the directives from the emergency standing procedure (Ascension St. Vincent's, 2020). Appendix A contains the whole ESO for hypoglycemia.

A low blood glucose level (BG) is defined by the ESO as less than 70 mg/dl. The ESO mandates that a second BG measurement be taken if any of the measurements are less than 70 mg/dl. An RN should inject 25 g of D-50 intravenously if the second reading is less than 30 mg/dl. Notifying the provider, the RN is to repeat the blood glucose measurement and administer therapy until the result exceeds 70 mg/dl, following a 15-minute rest period. The physician should be notified once again if the patient takes three doses of D-50 and the BG level does not exceed 70 mg/dl.

While a BG of 30 and below requires that the RN follow the protocol steps listed above, when the BG reading is between 31-70 mg/dl, the RN should administer three tabs of glucose (for a total of 12 g of glucose) if the patient is able to swallow and is able to take medications by mouth. If the patient cannot swallow or has an order for nothing by mouth, the RN should administer 12.5 g of

D-50 intravenously. The provider should be notified, and the BG reading should be taken again 15 minutes after treatment. The patient should receive additional treatment if the measurement is below 70 mg/dl, and this process can occur a third time. After the third cycle of measurement and treatment, the provider should be notified if the BG reading continues to fall below 70 mg/dl. For the patient who is unresponsive and cannot swallow and who additionally does not have an intravenous access route, the monitoring cycle follows this same pattern but the treatment requires the administration of 1 ampule (1mg) glucagon via the intramuscular route.

Lack of communication between the registered nurse (RN) and the patient care technician, RNs who called the provider for orders rather than using the ESO for treatment, and RNs who claimed that their workload prevented consistent and appropriate monitoring of the BG after initial treatment have all been cited as reasons for the lack of appropriate measurement and treatment. Patients with low blood glucose readings close to the time when registered nurses shift shifts and those who receive hypoglycemia treatment in one department—the post-anesthesia care unit, for example—but do not receive follow-up care after being transferred to another area have also been implicated in the inappropriate treatment of hypoglycemia. This analysis led to the problem statement that served as the project's and intervention's focal point: At a hospital in Clay County, Florida, the medical/surgical/telemetry unit improperly measures, monitors, and treats hypoglycemic episodes.

- Quality Improvement Framework and Change Theory

The proposed project is in line with the JHNEBP model and organizational nursing support, which aims to improve patient outcomes (Dang & Dearholt, 2018). When put into action in a real-world context, the project will adhere to Kotter's (1995) change model. According to Kotter (1995), the eight-step paradigm for change starts with creating a feeling of urgency for an opportunity and finishes with instituting new techniques to sustain the change. The selection of these models was based on their ability to supplement healthcare initiatives grounded in research.

According to Kotter (1995), the first thing to do when trying to implement change is for the group leading the effort to determine and explain the urgency of the need for the change. When 67% of patients admitted to a medical-surgical unit had an HGE within four months, it became clear that the institution needed to make some changes. A change in approach was urgently needed due to the high occurrence of HGEs. No quality improvement initiatives have been reported in the past that dealt with patient outcomes such the duration from HGE to euglycemia, active monitoring of protocol outliers, or hypoglycemia protocol adherence. Using a systematic best practice approach to manage or reduce hypoglycemia incidents was not a priority in usual care. Critical to the project's success was building, connecting with, and inspiring a team to alter hypoglycemia management.



Since BG management is a crucial part of diabetes care planning, it is important to comprehend the relationship between diabetes and hypoglycemia in order to reduce the prevalence of hypoglycemic episodes in the hospital setting (Silbert et al., 2018). According to data from the Centers for Disease Control and Prevention (CDC), 34.1 million Americans had diabetes in 2018, and 7.3 million of those people did not have a diagnosis (CDC, 2020). Approximately 16 million individuals were diagnosed with diabetes in 2016 out of all those who visited the emergency room for treatment; of those patients, 35.1% were hospitalized to an inpatient setting (CDC, 2020). Furthermore, 22.3% of the 235,000 individuals who reported to emergency rooms in 2016 with a hypoglycemia crisis were admitted as in-patients (CDC, 2020).

According to the World Health Organization (WHO), diabetes is a collection of metabolic diseases linked to malfunctioning beta cells in the pancreas. The incapacity to adequately metabolize proteins, lipids, and carbohydrates as well as improper insulin secretion or action are the defining characteristics of these illnesses (WHO, 2019). Type 1 and type 2 diabetes are two categories of diabetic presentations that are frequently seen in the medical, surgical, and telemetry setting. When the immune system malfunctions and the pancreatic cells are attacked, the pancreas is unable to produce enough insulin, which leads to type 1 diabetes (NIDDKD, 2017). Since type 1 diabetes is impacted by both genetic and environmental factors, it can develop at any point in life, but it is more likely to occur in childhood (NIDDKD, 2017). Insulin resistance is a cause of type 2 diabetes. In an attempt to reverse the effects of insulin resistance, the pancreas increases insulin secretion; however, this effort is insufficient, and as a result, the blood glucose level remains elevated (NIDDKD, 2017).

There are numerous ways to manage type 2 diabetes, and these approaches are applied gradually. The American Association of Clinical Endocrinologists and the American College of Endocrinology (2020) summarized in an executive summary that the management of type 2 diabetes should prioritize lifestyle variables, with a pharmaceutical regimen tailored to the specific needs of each patient. Furthermore, it was mentioned that continuous monitoring of the risk of hypoglycemia crises is necessary to prevent this dangerous and potentially lethal side effect of BG management (American Association of Clinical Endocrinologists and American College of Endocrinology, 2020).

Due to the activity limits that can be placed on the individual experiencing these episodes, patients frequently underreport these events, therefore clinicians may not be aware that patients who are admitted to the hospital have a history of hypoglycemia incidents (Silbert et al., 2018). The loss of driving privileges is an illustration of a restriction. Yun and Ko (2015) pointed out that if neuroglycopenic symptoms appear before autonomic signs, hypoglycemia incidents could also be unreported because the person is unaware of their glycemic condition. Autonomic symptoms include sweating, dizziness, tremor, and hunger, while neuroglycopenic symptoms include weakness, confusion, and difficulty concentrating (Yun & Ko, 2015).

In the absence of medication and close observation, hypoglycemia is likely to occur in the diabetic. Individuals with diabetes who use insulin or sulfonylureas to control their blood glucose (BG) are more susceptible to hypoglycemia if they have been using insulin for a long time, if they are pregnant, old, or in their adolescent years. Yale et al. (2018) have identified several risk variables,

such as autonomic neuropathy, chronic kidney disease, low economic position, and food insecurity.

- Standards for the Care of Inpatients

According to the American Diabetes Association (2020), all hospitals should have a hypoglycemia protocol, patients should have individualized care plans, hypoglycemic events should be recorded, and patients should receive follow-up treatment after each episode. In addition, the American Diabetes Association stressed the need of nurse-led hypoglycemia treatment programs. Educating, detecting, assessing, treating, and following up are all components of effective hypoglycemic procedures (Griffing, 2016). If a person is experiencing hypoglycemia, the National Institute of Diabetes and Digestive and Kidney Diseases (2016) suggests giving them 15 milligrams of carbs and checking their blood sugar again in 15 minutes. The patient should keep doing this until their blood glucose reading is within the normal range. In lieu of the 15 mg of carbohydrate, the American Diabetes Association (2020) suggests using either glucose tablets or gel, four ounces of juice, or one spoonful of sugar or honey to treat hypoglycemia. An injection of glucagon may be administered to individuals who are unable to swallow or self-treat when they are experiencing severe hypoglycemia (ADA, 2020).

Pantey and Chauhan (2015) conducted a prospective observational research to decrease hypoglycemia episodes in hospitalized patients. As part of the research, a protocol for the treatment and reporting of hypoglycemia was developed and staff nurses were educated on their responsibilities in this area. As part of the onboarding process for new nurses, researchers also

taught them the ropes. Each time a hypoglycemic incident occurred, the participating educators would do a root cause analysis. The nurses' orientation training was revised based on the results of the root cause analysis. The researchers found that the incidence of hypoglycemia events fell from 6.4 per 1,000 hours to 4.7 per 1,000 hours after the three-year trial period. Timely completion of root cause analyses, continuous education initiatives, and ongoing monitoring for hypoglycemic incidents were the determinants of the program's success. When a nurse-driven policy for managing blood glucose (BG) was implemented in an intensive care unit (ICU), Compton, Ahlborn, and Weidehoff (2017) discovered that the rate of hypoglycemia incidents changed statistically significantly. The goal of managing patient BG on an as-needed basis by the intensive care unit intensivist was to maintain BG levels between 140 and 180 mg/dl. The nurse could now modify insulin dosages according to the new protocol as long as the blood glucose level was within the 70–299 mg/dl corridor. If the blood glucose level fell below 70 mg/dl or rose above 300 mg/dl, the nurse was instructed to inform the intensivist. It was shown that there was a substantial decrease in hypoglycemia occurrences and an increase in minimum blood glucose levels upon comparing retrospective patient BG data with data collected after the protocol was implemented ($p < 0.001$).

As part of a quality improvement project, Griffing (2016) created and implemented a methodology for nurse-driven blood glucose management in an effort to increase inpatient BG stability. Caregivers were educated as part of this intervention on the need of preventing low blood glucose readings and breaking the loop of reactive therapy to hypoglycemia. The nurses were provided with pamphlets that explained the modifications to procedures. At the nurses' stations, you could find the revised protocols as well. Preventing hypoglycemia and treating it were the two main

components of the strategy. Intravenous 10% dextrose solution infusion was one of the preventative methods. Read on for more on the treatment procedures. According to the guideline, if the blood glucose level is less than 70 mg/dl, the patient should be given 12- 15 mg of carbs or 25 ml of intravenous dextrose 50% after contacting their healthcare physician. After then, the BG would be monitored every 15 minutes until it reached 70 mg/dl or above. Blood glucose levels were monitored at the 30- and 60-minute points following a reading of 70 mg/dl or higher to show that the blood glucose level had stabilized. There was a decrease in hypoglycemia episodes and BG fluctuation at the project location during the study period.

- Information Relevant to the Nursing Care of Hypoglycemia

Nurses caring for diabetic patients were the subjects of an observational study and survey by Waheed (2017) that sought to describe their level of knowledge about diabetes and how to treat hyper- and hypoglycemia. The RNs' competence in drawing blood for testing, recording the BG, and responding appropriately was the focus of the observations. In order to assess the registered nurses' familiarity with hospital policies concerning diabetes, hyperglycemia, and hypoglycemia, the knowledge exam was developed by project stakeholders and subject area specialists. Prior to its implementation in this project, the exam was pilot tested to ensure its validity by subject-matter experts. According to the results of the observational activity, 71.9% of the nurses were using the proper procedures to get an accurate blood glucose reading (Waheed, 2017). According to the results of the knowledge evaluation, nurses are well-versed in treating hypoglycemia episodes, but they are less well-versed in hyperglycemia and its proper treatment protocols. Hyperglycemic and

hypoglycemia episodes might go undiagnosed or treated inappropriately due to a lack of information regarding blood glucose levels and how they match patient presentation.

Alotaibi et al. (2017) found a large discrepancy between the nurses' self-reported and objective knowledge of diabetes in a mixed-method study that sought to assess Saudi Arabian nurses' understanding of the disease. The two instruments utilized by Alotaibi et al. (2017) to evaluate the knowledge of nurses were the Diabetes Basic Knowledge Tool and the Diabetes Self-Report tool. Hyperglycemia and hypoglycemia symptoms, diabetic complications, patient foot care, medication treatment, disease pathology, and dietary recommendations were among the diabetes-specific topics covered in the nurse survey (Alotaibi et al., 2017). While the nurses in this study did report feeling confident about diabetes, they also acknowledged gaps in their knowledge, which raises concerns about the disparity between their actual and perceived knowledge. Limited resources, inability to attend training sessions, and insufficient encounters with diabetic patients were the reasons given by RNs for the lack of knowledge. Hospitals should remove obstacles to nurse education, according to Alotaibi et al. (2017), since registered nurses must get continuous education on the symptoms and complications of diabetes.

Lange and Pearce (2017) surveyed 304 nurses for an exploratory study on diabetes-related nursing knowledge; 69 nurses responded. Community health nurses, acute care nurses, and nurse practitioners were among the many types of nurses that took part in the poll. The researchers created a survey that included questions regarding diabetes knowledge as well as confidence in one's capacity to provide proper care for people with diabetes. According to a recent survey by

Lange and Pearce (2017), nurses have a high level of self-confidence when it comes to their understanding of diabetes and organizational policy about the management of hypoglycemia. However, there were several misconceptions about diabetic medicine management and hypoglycemia that were revealed by the study data. A association between education degree and right or wrong answers did not exist at the statistical level. Because the nurses reported feeling confident in their expertise and comfortable caring for the diabetic patient, Lange and Pearce (2017) found it troubling that queries regarding medications and hypoglycemia were not asked. Among the many suggestions made by the study's authors was the need for more diabetes-related organizational training, and another was that nurses should take greater initiative to keep up with developments in the field.

Researchers Ndebu and Jones (2017) used a cross-sectional survey methodology to find out how well-versed on diabetes inpatient healthcare workers in a UK acute care setting were. The study's findings were categorized according to the healthcare provider's function. Ninety percent of nurses in this sample agreed that hypoglycemia lengthens hospital stays and increases mortality risk, and seventy-five percent agreed that blood glucose levels should be monitored fifteen minutes following treatment for a hypoglycemic episode. Although it is recommended to delay insulin administration following a hypoglycemia episode, only 10% of patients would have adhered to this recommendation. Nurses should be trained to recognize and manage unfavorable patient manifestations associated with diabetes, such as hypoglycemia (Ndebu and Jones, 2017). In addition, Ndebu and Jones (2017) pointed out that having more support workers on the units could help with patient monitoring

- Conclusion.

There are some challenges that can accompany nursing in the midst of a pandemic. Staffing changes, the temporary loss of frontline leaders and increased patient loads have all played a role in reducing the amount of time nurses have to complete independent learning. This project suggests that it would benefit the bedside care team if nurse educators and the diabetes management team integrated ESO education into the orientation of all registered registrars, including experienced registrars and travelers. It was recommended that members of the assistant team also receive education regarding civil society organizations. Timely communication from team members affects the bedside care nurse's ability to treat a patient in a timely manner. It is also recommended that education be provided to all team members regarding communication with the provider. Now that this metric is captured in the electronic medical record, timely provider communication should be considered the standard of care rather than an exceptional practice activity.

. It was suggested that members of the ancillary team should also be educated on ESOs. The capacity of the nurse providing bedside care to treat the patient promptly is affected by the timeliness of the communication from these team members. Additionally, all team members should get instruction on provider communication. Now that this measure is being recorded in the EMR, it should be seen as the standard of care, not an exceptional practice activity, to communicate with the provider promptly.

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