

Southern Illinois University Edwardsville

**SPARK**

---

Doctor of Nursing Practice Projects

School of Nursing

---

Spring 5-7-2021

## Addressing Referral Discrepancies for Hyperglycemia Diagnosis Codes

Brooke Buffington

Aubrey Parnell

Abigail Brohammer

Follow this and additional works at: <https://spark.siu.edu/dnpprojects>



Part of the [Family Practice Nursing Commons](#)

---

### Recommended Citation

Buffington, Brooke; Parnell, Aubrey; and Brohammer, Abigail, "Addressing Referral Discrepancies for Hyperglycemia Diagnosis Codes" (2021). *Doctor of Nursing Practice Projects*. 137.  
<https://spark.siu.edu/dnpprojects/137>

This DNP Project is brought to you for free and open access by the School of Nursing at SPARK. It has been accepted for inclusion in Doctor of Nursing Practice Projects by an authorized administrator of SPARK. For more information, please contact [magrased@siue.edu](mailto:magrased@siue.edu), [tdvorak@siue.edu](mailto:tdvorak@siue.edu).

## **Introduction**

Diabetes mellitus and prediabetes affect 34 million and 88 million Americans, respectively. According to the Center for Disease Control and Prevention (CDC, 2020), diabetes mellitus cost the healthcare system an estimated \$327 billion in 2017. Stakeholders at a central Illinois healthcare institution noted that diagnostic coding for elevated blood glucose (R73) was occurring at a significantly higher rate than endocrinology referrals. Following the Lean Six Sigma model, a retrospective investigation was conducted to determine the root causes of this disproportion. Wait times, provider availability, referral trends, diagnosis prevalence, and demographics were among the numerous topics explored. Analysis of the data and trends will lead to targeted interventions to improve efficiency, reduce inconsistencies, and ultimately patient health outcomes.

## **Literature Review**

The early detection and management of elevated blood glucose levels are fundamental to preventing diabetes comorbidities and mortality. Endocrinology referrals allow for more specialized care and reduce the long-term consequences of diabetes. Setji et al. (2019) reported that patients with diabetes managed by an endocrinologist were found to achieve target blood glucose levels sooner and were more likely to have a different medication class prescribed within 90 days than patients managed by a primary care provider (PCP). Hemoglobin A1C values are important in diagnosing and monitoring diabetes as this lab reflects blood glucose over a three-month period. Achieving target A1C values early can slow the progression of microvascular and macrovascular complications over time (ADA, 2020b). Gulliford (2008) found that diagnosis of myocardial infarction, cerebrovascular disease, ischemic heart disease, and peripheral nerve disorders increased in the six months after diabetes was diagnosed.

An interdisciplinary team managing diabetes can consist of the PCP, an endocrinologist, an ophthalmologist, a cardiologist, a podiatrist, a diabetes educator, a fitness instructor, and a dietician (Clement et al., 2018). A referral to endocrinology may be considered for better glucose control or after complications of diabetes have developed (Healy et al., 2018). Tzartzas et al. (2019) state that the decision to refer a patient to an endocrinologist is subjective and may vary from one physician to the next. Tsai et al. (2020) found that elderly diabetic patients who use PCPs for the management of diabetes had an increased rate of adverse outcomes compared to those with care in a specialized setting.

Improved communication between the interdisciplinary team may result in better diabetes control. Scaioli et al. (2020) surveyed PCPs in 34 different countries and found that there were higher rates of communication with specialists when direct modes of communication such as phone calls were used as opposed to communication through patient notes or care plans. Mehta et al. (2017) surveyed PCPs regarding the use of diabetes screening guidelines and found that, of 305 physicians surveyed, 38% used guidelines from the American Diabetes Association (ADA) and the US Preventative Services Task Force (USPSTF), 33% used ADA only, and 25% used USPSTF only. While other countries have established recommendations to guide the PCP in the referral process, this literature search did not produce current algorithms or evidence-based referral guidelines to the endocrinology specialty in the United States.

## **Project Methods**

The purpose of this project was to investigate the disproportionate number of hyperglycemia (R73) diagnosis codes compared to the number of referrals to endocrinology in the healthcare organization. Approval for the project was approved by the Institutional Review Board (IRB) at the Southern Illinois University Edwardsville in January of 2021. Additionally,

approval was obtained from the organization's privacy department. ACT Test, an application from the stakeholder organization, was used to obtain de-identified patient data to determine the root causes for the disproportion of referrals. Data available from 2018-2020 was included to explore appointment wait times, referral rates, referral order status, medications prescribed, and demographic differences across family medicine, internal medicine, and endocrinology. The following search criteria were used: ages from 18 to 90 years old, R73 diagnosis codes, internal medicine and family medicine as referring providers, and endocrinology as the specialty referred to. After evaluating the evidence to determine patterns, inconsistencies, and potential root causes, evidence-based quality improvement interventions were recommended to improve the referral process and increase the referral rate to endocrinology for patients with R73 diagnosis codes.

## **Evaluation**

Data on provider availability revealed long wait times for patients with R73 codes. Within endocrinology, the third next available appointment was 24.3 days for new patient visits and 13.3 days for established patient visits. The average wait time in days for R73 codes in family medicine, internal medicine, and endocrinology, was 52, 63, and 90 days, respectively. These numbers were much higher than wait days for all codes within these departments. It was also found that endocrinology physicians had longer wait times in days but higher patient volumes than advanced practice providers (APPs), while the inverse was true for APPs.

Referral rates for R73 diagnosis codes were also examined across departments. The diagnosis code of "other abnormal glucose" warranted the most referrals from family medicine (n=15,651), while "hyperglycemia" warranted the most referrals from internal medicine (n=5,005). It was also noted that both family medicine and internal medicine had incomplete

endocrinology referrals for R73 diagnosis codes that needed more information or were being held.

The medications initiated and renewed to treat R73 conditions were evaluated across family practice, internal medicine, and endocrinology. Endocrinology prescribed the largest assortment of medications (n=15) to combat elevated glucose levels compared to family medicine (n=11) and internal medicine (n=11). There were only four mutual medications across the three departments. Endocrinology prescribed more complex medications in patient encounters (n=42%) compared to family medicine (n=1%) and internal medicine (n=6%).

Lastly, demographic data identified a gap in referral rate by age group and gender. The mean age in years of patients (with R73 as their primary diagnosis code) seen in total patient encounters in family medicine was 63, internal medicine was 65, and endocrinology was 53. There was also a notable discrepancy in the average age of patients referred to endocrinology from family medicine (60.4 years) and internal medicine (54.8 years) compared to the average age of patients seen in endocrinology for R73 diagnosis codes (52.7 years). Men in their 50s and women in their 60s were the largest demographics seen for R73 codes in endocrinology.

### **Impact on Practice**

The immediate impact of the investigation findings brought awareness to the inconsistencies across departments. The anticipated long-term impact of this project achieves increased endocrinology referral rates and improved health of patients with R73 diagnosis codes. To reduce prolonged wait times in endocrinology, a cost-benefit analysis can be conducted to weigh provider productivity and cost to determine the impact of additional endocrinology providers. Greater provider availability because of increased staffing can reduce patient wait times and can lead to improved patient satisfaction, better patient health outcomes, and may

increase the likelihood of primary care providers referring their patients to endocrinology sooner. Referral holds can be addressed by conducting a process analysis to determine the cause of referral holds and reduce delays in receiving care. The process analysis can address delays in referral order completion by auditing the patient's insurance information on file for completeness, assessing interoffice communication practices, and identifying timeframes for each step of the referral process. The demographic differences for R73 diagnosis prevalence and endocrinology referral rates can be addressed by creating an algorithm to standardize the R73 coding and referral process.

## **Conclusions**

Through stakeholder interviews and data collection, root causes were identified regarding the referral process at the organization. The literature review and data findings demonstrate that, while wait times may be increased when patients are referred to endocrinology, diabetes care with an endocrinologist is more specific and may lead to better outcomes. This root cause investigation highlighted several issues in the endocrinology referral process which will lead to further analysis and intervention in the future. By conducting a cost-benefit analysis of providers as well as a process analysis of referral delays, the healthcare organization can expect to improve provider availability and expedite endocrinology referrals. Additionally, an algorithm to standardize coding and referral processes will help to target at-risk populations. These interventions will lead to improved treatment and reduced morbidity and mortality in this patient population.

## **Author Contact Information**

Abigail Brohammer [abroham@siue.edu](mailto:abroham@siue.edu)

Brooke Buffington [bbuffin@siue.edu](mailto:bbuffin@siue.edu)

Aubrey Parnell [auparne@siue.edu](mailto:auparne@siue.edu)