

INCREASING POSTPARTUM SCREENING IN WOMEN WITH GESTATIONAL DIABETES
AT RISK FOR DEVELOPING TYPE TWO DIABETES MELLITUS

by

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A scholarly project submitted in partial fulfillment
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of

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in

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ABSTRACT

Background: Women diagnosed with Gestational Diabetes Mellitus (GDM) in pregnancy have a significantly increased risk of developing Type 2 Diabetes Mellitus (T2DM) within 5-10 years postpartum. Despite recommendations by the American Diabetes Association (ADA) and the American College of Obstetrics and Gynecology (ACOG) to screen for T2DM using a 2-hour 75g glucose tolerance test (gtt) within 4-12 weeks postpartum, national adherence rates remain below 60%. This quality improvement (QI) project sought to address this gap by enhancing screening rates at a women's specialist clinic in southwest Montana.

Methods: A 6-week provider-focused QI project was implemented to improve the identification and postpartum screening of patients with GDM. Interventions included staff education, the creation and utilization of a universal smart phrase in the electronic health record (EHR), and revisions to nursing workflow sheets. Weekly chart audits and qualitative interviews were conducted to evaluate staff adherence and ease of implementation.

Results: Among 154 postpartum patients reviewed during the study period, 3.9% (n=6) had a GDM diagnosis. The percentage of patients who received the recommended 2-hour 75g gtt increased from 54% to 83% (n=5) following the interventions. However, the utilization of the universal postpartum smart phrase was recorded in only 16% of cases. Qualitative interviews suggested that staff education and workflow sheet updates were more impactful than the smart phrase in improving guideline adherence rates.

Conclusion: While the project successfully increased postpartum screening rates for T2DM, the universal smart phrase was underutilized due to staff preferences and workflow habits. Future QI initiatives should focus on integrating automated EHR prompts, extending project timelines, and addressing long-term adherence through ongoing staff education, screening for previous GDM diagnoses in primary care, and patient follow-up for adherence to screening. These efforts are critical to reducing the burden of chronic disease in populations at elevated risk for T2DM.

CHAPTER ONE

REVIEW OF THE LITERATURE

Introduction

Type 2 Diabetes Mellitus (T2DM) is a chronic disease with significant morbidity and mortality, increasing in prevalence in the United States over the past decade. According to the Centers for Disease Control (CDC), it is estimated that 38.1 million Americans over the age of 18 are living with T2DM, and another 97.6 million meet the criteria as pre-diabetic, measured by their fasting blood sugars (FBS) and A1C measurements (2024). Gestational Diabetes Mellitus (GDM) is a form of diabetes that occurs from hormonally driven insulin resistance during pregnancy. The Agency for Healthcare Research and Quality (AHRQ) published a report noting that of the women diagnosed with GDM, it is estimated that 15-60% of them will go on to develop T2DM within 5-15 years after delivery (2008). The risk of a GDM diagnosis leading to the development of T2DM is why the American College of Obstetrics and Gynecology (ACOG) and The American Diabetes Association (ADA) recommend screening all women who had GDM for T2DM, impaired fasting glucose metabolism (IFGM) or glucose intolerance during the postpartum period (2018). Despite this recommendation, annual screening rates of women with GDM are between 30-70% in the United States, meaning thousands of American women are not receiving the education and healthcare prevention for complications of diabetes they require (Man et. al., 2016). This scoping literature review explores barriers to screening and shows that effective quality improvement projects increase screening adherence.

Background and Significance

Diabetes in the United States

According to the CDC, 38.1 million Americans ages 18 and older had diabetes in 2021. This accounts for 14.7% of the U.S. adult population. Twenty-two percent of these adults were unaware they met laboratory criteria for a diabetes diagnosis (2024). In addition, 97.6 million adults, 38% of the U.S. adult population, have pre-diabetes based on their fasting blood glucose or A1C level but only 19% of adults with pre-diabetes reported being told by their primary care provider about their condition (CDC, 2024). While social determinants of health including race, gender, and socioeconomic status impact the development of T2DM, pre-diabetes affects Americans across their lifestyle differences. The American Diabetes Association reports complications of diabetes to include cardiovascular disease, stroke, chronic kidney disease, blindness, neuropathy, hearing loss, and foot and skin complications that may lead to amputation of limbs (n.d.).

Gestational Diabetes Mellitus

Gestational Diabetes Mellitus (GDM) is a form of Diabetes that complicates approximately 10% of pregnancies in the United States (CDC, 2024). Complications of GDM may include large for gestational-age infants, increased risk of cesarean delivery, stillbirth, and the development of T2DM after delivery. While insulin resistance often resolves immediately after delivery, women with GDM have a 35-60% risk of developing T2DM within five-ten years after delivery compared to women without GDM during their pregnancies (Man et. al., 2016). Risk increases with subsequent pregnancies diagnosed with GDM, age, polycystic

ovarian syndrome (PCOS), ethnicity, as well as lifestyle risk factors for T2DM including high sugar, low fiber diet, inactivity, and obesity.

Screening

Considering roughly 50% of women with GDM will go on to develop T2DM in the next decade, the ADA and ACOG recommend routine screening with a fasting 75g 2-hour glucose tolerance test (OGTT) between four and twelve weeks after delivery. This test assesses for impaired fasting glucose metabolism, glucose intolerance, or overt T2DM in women diagnosed with GDM when pregnancy hormones are no longer affecting sensitivity to insulin (2018). While screening rates for GDM during pregnancy are close to 90%, completion of diabetes screening postpartum is <50%, with some reports citing as low as 10% (Bauer et al., 2023). This is a considerable healthcare gap, often impacting at risk populations the most. The Society for Maternal-Fetal Medicine (SMFM) reports barriers to screening to include termination of Medicaid coverage by four-eight weeks in some states, transportation, and newborn care to complete testing, knowledge deficit, communication deficit between patients and their doctors, fragmentation of care between obstetricians and primary care providers, and system barriers (2023).

Significance of problem in Montana

Populations disproportionately impacted by T2DM and GDM include those living in rural communities, low socioeconomic status, and certain ethnicities including American Indians. In Montana, 44% of the population lives within a rural community and the March of Dimes reports that 50% of counties in Montana are healthcare deserts compared to a national average of 32% (2023; Montana Legislature, n.d.). While information regarding rates of postpartum diabetes

screening in the State of Montana is not available, the rural nature of Montana citizens increases their probability of not receiving routine prenatal care, postpartum diabetes screening, and adequate annual screening and surveillance with an established primary care provider. American obstetrics has traditionally focused on negative maternal outcomes only in the first 40 days following delivery, however, maternal morbidity includes the risk for the development of chronic disease. This scoping review focuses on increasing screening to reduce the risk of developing T2DM beyond the standard 40-day window, especially for rural women who do not often receive routine care after the postnatal period has ended.

Economic cost

The CDC reports that in 2022, diabetes and complications related to diabetes accounted for \$413 billion in medical costs, lost days at work, and lost wages in the U.S. (2024). The cost of the 75g OGTT screening is covered by insurance companies as part of routine pre and postnatal care, and Montana Medicaid increased their coverage to 12 months for postpartum women in 2023. The screening for and capturing of pre-diabetes and T2DM postpartum would have a significant impact on both the morbidity and mortality of Montanan women and the financial burden on the U.S. healthcare system.

A Scoping Review of the Literature

Methods

A scoping review of the literature was conducted to assess the available scholarly data on barriers to postpartum diabetes screening and interventions targeting adherence to ADA and ACOG guidelines. Evidence-based articles were identified through available peer-reviewed

library and research databases including Montana State University's Catsearch, Cumulative Index to Nursing and Allied Health Literature (CINHAL), Google Scholar, and PubMed. Reference lists from systematic reviews and previous intervention-based articles were also used to identify relevant studies. Keywords utilized in the scoping review include postpartum diabetes screening AND interventions, "postpartum diabetes screening" AND interventions, postpartum diabetes screening AND interventions AND ("United States" OR "UA" OR "USA"), postpartum diabetes screening AND interventions AND adherence. Further subtopics utilized in the search included "gestational diabetes mellitus", "pregnancy", "postpartum".

Inclusion criteria Articles selected in the scoping review must have been published within the last ten years, peer-reviewed, written in English, conducted within the United States, with full texts available online. See the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) diagram in Appendix A.

Study selection Priority was given to studies focusing on identifying barriers to postpartum screening, interventions focusing on increasing screening rates per the ADA and ACOG recommendations, and applicable implications for practice. Search strategies initially yielded 81 articles with 76 eligible for review after duplicates were reviewed. Articles were initially screened assessing their abstracts for relevance. Forty-nine texts were then excluded for ineligibility based on established inclusion criteria. Many articles were still found to have been conducted outside of the United States with standards of care not applicable to the U.S. recommendations or primarily focused on diabetes in combination with cardiovascular disease in pregnancy. Twenty-seven articles remained for full text assessment and 13 were selected for inclusion in the final qualitative synthesis. One retrospective chart review with an applied

intervention, three retrospective cohort studies, one special statement from the Society of Maternal Fetal Medicine on practice recommendations, two qualitative interview studies, four random controlled trials, and one systematic review. Seven studies focused on quality improvement interventions to increase adherence to screening, four retrospectively or qualitatively reviewed past electronic health records and patient reports, and two focused on identifying barriers and facilitators to postpartum diabetes screening order and completion.

Results

Barriers to screening While most of the studies discussed barriers to postpartum diabetes screening, two studies focused primarily on identifying why screening rates are so low. Two studies identified specific patient barriers including lapse of Medicaid coverage after 60 days in some states, childcare or transportation concerns, non-flexible clinic or lab hours, low health literacy, and lack of education on their risk for developing T2DM. Provider-related barriers include care fragmentation between obstetrical providers and primary care, lack of redundancy reminders in electronic healthcare systems, and a cultural focus on the immediate labor and fetal risks of Gestational Diabetes, rather than focusing on long-term chronic disease prevention (Bauer et al., 2023; Sinha et al., 2022). Sinha et. al. went on to describe facilitators to postpartum diabetes screening, including pregnancy support groups, providing educational materials, a focus on child wellbeing, personal healthcare empowerment, and establishing healthy food and exercise patterns prior to pregnancy (2022). Many of the observational studies found that lack of education may be one of the biggest modifiable factors. Women need to know their risk for T2DM extends beyond their delivery and given tools to increase their own health literacy (Lucas et al., 2022).

Risk factors for inadequate follow-up also include age, parity, BMI, and non-Caucasian populations (Strelow et al., 2023). One study found that black patients are more likely to receive screening through A1C testing than their non-black counterparts, and women living in Western states have higher rates of screening than those in the Northeast or South (Eggleston et al., 2016). Rural patients also access primary care at lower rates than those living in larger metropolitan areas and are less likely to receive diabetes-specific care (D'Amico et al., 2023).

Prenatal Education All but two of the articles focused on the importance of specified prenatal education on the increased risk of developing T2DM in the next decade. Women with more healthcare encounters, whether for medical management of gestational diabetes or engagement in third-trimester education programs facilitated by their healthcare providers (including obstetricians, nurses, or dieticians) have higher screening rates than those who do not attend annual healthcare visits (Hamel & Werner, 2017; Man et al., 2016). When patients receive prenatal counseling on diet, exercise, and their T2DM risk, they are more likely to participate in postpartum screening. Rural patients and those with a low socioeconomic status have an increased risk of either not completing their screening or not having the recommended screening ordered for them (Jones et al., 2018). Prenatal education should be proactive, involving disciplines including the physician, nurse, dietician, and the patient with a focus on increasing self-efficacy and personal prevention of T2DM. While these interventions were not shown to change the rate of attendance to postpartum office visits, they increased the likelihood of screening patients who were already committed to attending their postpartum follow-up (Hamel & Werner, 2017; Soffer et al., 2017).

One study uniquely did not see any improvement in screening rates after implementing an educational intervention that focused solely on patient education. Amason et al. reported that patients in their study perceived their risk of T2DM to be low, or inevitable based on genetics. However, significant barriers noted by researchers included a lack of ordering the test and a lack of coordination help from the office to facilitate adherence (2016).

Immediate Postpartum Testing Current recommendations from the ADA and ACOG do not endorse A1C or screening before 4 weeks postpartum, however despite specified educational interventions, many researchers fail to reach screening adherence rates higher than 50-71%. Two research teams focused on assessing the specificity and sensitivity of immediate postpartum screening on day two during hospitalization in detecting T2DM or impaired fasting glucose metabolism (IFGM) compared to screening between four and twelve weeks postpartum (Waters et al., 2020; Werner et al., 2020). Results showed testing on day two postpartum was as predictive in identifying the risk of T2DM or IFGM as standard six-week testing, and especially predictive in excluding an immediate diagnosis of T2DM. While some women showed improvement in glucose response between testing, others progressed from normal to impaired by their second test. Researchers found that while immediate postpartum testing should not replace current recommendations, it may be a feasible option for capturing a higher percentage of patients and serving as a prompt for providers to follow up on recommended screening. Even when incentivized to follow up for testing after hospital discharge, one-third of patients only completed testing on day two after delivery (Waters et al., 2020; Werner et al., 2020). Given the low adherence despite quality improvement interventions, the SMFM also discussed that

inpatient postpartum testing may be a considerable option to capture a higher percentage of patients not otherwise screened (Bauer et al., 2023).

Conclusion

The research suggests that patient and provider education have the greatest impact on a patient's adherence to postpartum screening. Successful implementation of a quality improvement intervention needs to be specific to the population a healthcare facility is serving (Bauer et al., 2023). While often the focus is on how to increase patient adherence, there is significant room for buy-in from providers to focus on education targeted at increasing patient self-efficacy. This seems to best be done by focusing on helping patients create healthy nutrition and exercise habits while making sure they are aware of their increased risk of developing T2DM over the next decade. While some patients reported beliefs that their diagnosis may have been inevitable, T2DM is a disease primarily impacted by lifestyle choices around diet and activity levels (Amason et al., 2016). Patients can help reduce their risk by participating in annual healthcare visits, making sure their primary care providers are aware of their previous diagnosis of GDM, and making lifestyle changes to improve glucose metabolism (Jones et al., 2018). Many of the successful interventions focused on education during the third trimester. This intervention makes sure that the education provided is not forgotten throughout a 40-week pregnancy.

However, focusing on patient education is not enough to address provider-specific barriers to screening. Providers must remember to order screening and coordination of healthcare facilities with patient schedules would increase the chances of screening adherence (Amason et al., 2016). This may look like blocking schedules for 6-week postpartum visits as the first

appointment on the daily schedule to allow patients to arrive fasting to their appointments and complete screening on the same day. Studies also found that patients benefited when they were reminded by their healthcare providers to attend their appointments fasting to complete the test, including nurses, physicians, midwives, or dieticians (Amason et al., 2016; Soffer et al., 2017).

Montana serves a higher proportion of rural patients than many other states, meaning interventions should also be focused on capturing patients who may have significant barriers to screening like travel time, childcare, and decreased primary care access. Education focused on the importance of annual primary care follow-up would help address the gap in care rural patients receive.

Implications for practice

American obstetrical care is known for focusing on immediate prenatal and postpartum outcomes, often without follow-up past the six-week visit. In addition, primary care providers do not routinely inquire about diagnoses that complicated previous pregnancies. Both specialties need to increase focus on chronic disease management and prevention while individualizing care and patients would benefit from a focus on long term health goals based on their maternal history. Achieving this will take increasing health literacy in all patients, reducing fragmentation between healthcare specialties, and extending how long we consider women to be postpartum.

Providers should also consider which patients are the highest risk for the development of T2DM without appropriate follow-up. This has been shown to include patients with low socioeconomic status, who live in rural communities, and non-Caucasian patients (Eggleston et al., 2016; Strelow et al., 2023). These patients may be candidates to discuss immediate

postpartum testing with annual primary care follow-up, where risk of overt T2DM can be reliably excluded if results are normal (Waters et al., 2020).

Quality improvement projects that focus on staff education, redundant prompts in the electronic health records, and patient education focused on diabetes prevention will be the most effective in increasing screening rates (Bauer et al., 2023; Jones et al., 2018). Referrals to establishing with a primary care provider may also help address communication barriers between providers and increase patient follow-up at one and three years postpartum.

CHAPTER TWO

QUALITY IMPROVEMENT PROPOSAL

Introduction

The International Diabetes Federation (IDF) reports that 10.5% of the global adult population has diabetes mellitus, with almost half of those individuals unaware they are living with this condition (2024). The IDF further estimates that one in eight adults will be living with diabetes by 2045 (2024). In the United States (U.S.), the CDC reports 38.1 million Americans are living with diabetes, with 22.4% unaware that they meet laboratory criteria for the diagnosis (2024). Gestational Diabetes Mellitus (GDM) affects roughly 10% of pregnancies in the U.S. and predisposes affected women to developing Type 2 Diabetes Mellitus within five years postpartum (AHRQ, 2008). While rates of diabetes in Montana remain below the national average, the unique rural populations in the state pose an increased risk for disease disparity (Montana Department of Public Health and Human Services [DPHHS], n.d.). According to an article by Dugani et al., rural populations have a 16% higher prevalence of T2DM compared to urban populations (2021). Despite the heightened risk of developing T2DM after a pregnancy complicated with GDM, only 10-50% of women receive the recommended 2-hour 75g glucose tolerance test during the postpartum period (Bauer et al., 2023). With rising rates of T2DM, significant proportions of the population are unaware they meet the criteria for the diagnosis, and the known complications associated with this disease, obstetrical providers are uniquely positioned to screen for chronic disease in populations of women who may not receive the necessary primary care follow up.

A scoping review of the literature found that quality improvement (QI) projects solely focused on educating patients about their risk of developing Type 2 Diabetes after delivery do not effectively address all the barriers patients encounter in obtaining adequate screening and care. QI projects should prioritize decreasing the barriers that prevent patients from receiving the necessary screenings. This includes enhancing patient education nursing education, as well as ensuring the correct 2-hour glucose tolerance test is ordered prior to the six-week postpartum visit. This timing is crucial, as postpartum patients often do not follow up with their providers after six weeks unless other complications from pregnancy arise that require additional care.

Problem Statement

A women's specialist clinic in southwest Montana serves approximately 700 to 800 pregnant women annually, offering specialty care with Maternal Fetal Medicine, Obstetricians, and midwives. The clinic is equipped to provide integrative care to families; however, an assessment revealed that despite the established recommendations for a 2-hour 75g glucose tolerance test to be conducted between four and twelve weeks postpartum, nearly half of patients diagnosed with GDM during their pregnancy do not have the necessary orders entered into the electronic health record (EHR) during their prenatal and postpartum care. With 44% of the Montana's population residing in rural areas, the patient population is at an increased risk of developing chronic disease without adequate surveillance and detection (D'Amico et al., 2023).

Aim Statement

The ADA and ACOG recommend that patients diagnosed with GDM in pregnancy undergo a 2-hour 75g glucose tolerance test between four and twelve weeks postpartum. Despite

recommendations, only 54% of patients with GDM have had this screening ordered by their obstetrical provider. We aim to increase postpartum screening for T2DM from 54.5% to 75% by March 2025.

Smart Goals

Table 1: Short-term goals

SMART Goal #1: Smart phrase will be created and approved by clinic leadership by January 15th, 2025.		
- Smart phrases will be developed and available for use by all staff in the electronic health record - Smart phrase will be created by the facilitator and generalized enough to be used with all postpartum patients, regardless of gestational diabetes diagnosis - Smart phrase will be intended to be used by all staff rooming postpartum patients during both two and six-week postpartum visits.		
Data to be collected	Collection Process	Planned data analysis
Verbal approval from leadership.	The lead facilitator will collect verbal approval from leadership.	The lead facilitator will evaluate need for changes and edits prior to staff education and the project start date.
SMART Goal #2: Clinic staff will be educated on current recommendations for 2-hour glucose screening during the postpartum period and implementation of smart phrases by January 15th, 2025.		
- Education to include current clinic ordering adherence at 54.5% - Current ADA and ACOG guidelines for postpartum screening to include: 2-hour 75g glucose tolerance test completed between 4 and 12 weeks postpartum - Plan to identify patients with a GDM diagnosis at the two-week visit and order glucose tolerance test, which patients will be instructed to complete before the six-week appointment. - Written goals provided to each nurse and medical assistant (MA) who will be responsible for rooming patients during postpartum care.		
Data to be collected	Collection Process	Planned data analysis

Table 1 Continued.

Read and sign an attendance sheet for education with a planned 90% attendance.	The lead facilitator will collect the sign-in sheet from the meeting.	The lead investigator will evaluate for attendance and provide additional education to staff unavailable to attend a meeting prior to the start date on January 15 th , 2025.
SMART Goal #3: Update the nursing pregnancy checklist in all nursing pods to include postpartum screening for gestational diabetes by January 15th, 2025.		
- Updated nursing flowsheet typically present at all clinic desks to include postpartum screening for gestational diabetes and orders for: 2-hour 75g glucose tolerance test - A tolerance test is to be ordered at a 2-week visit with instructions to complete between four and twelve weeks postpartum, ideally before the six-week visit. - Updated flowsheet available on a shared drive		
Data to be collected	Collection Process	Planned data analysis
Verbal approval for updated flowsheet by leadership staff.	Lead facilitator to ensure updated electronic flowsheet is available on shard drive and distributed to each nursing pod.	The lead facilitator will evaluate the document for necessary edits prior to implementation.

Table 2: Medium-term goals

SMART Goal #1: Smart phrase will be utilized in 90% of all postpartum visits during the implementation period		
- Weekly analysis of postpartum visits and rooming notes to include smart phrase - Education to staff when smart phrase is not utilized		
Data to be collected	Collection Process	Planned data analysis
The number of patients roomed with the smart phrase for their postpartum visits divided by the total number of postpartum patients seen in the clinic.	The lead facilitator will be accessing charts weekly to assess for usage of smart phrase during rooming notes	The lead investigator will divide the number of postpartum patients roomed with the smart phrase by the total number of postpartum patients seen to evaluate adherence rates of the smart phrase. Qualitative interviews with staff regarding ease and usage of smart phrase.

Table 2 Continued.

SMART Goal #2: at least 75% of patients diagnosed with GDM will have an order for the 2-hour 75g glucose tolerance test placed during their two or six-week postpartum visit during the implementation period.		
- Smart phrase utilization and communication with ordering providers will be the primary strategy for routinely identifying patients with GDM and ordering the glucose tolerance test accordingly - The six-week visit will be a second chance to order the tolerance test if not already completed and still be within the guideline recommendations for postpartum screening (four and twelve weeks).		
Data to be collected	Collection Process	Planned data analysis
Number of patients seen for a post-partum visit that received an order for a 2-hour gtt (numerator), the total number of postpartum patients seen in the clinic (denominator)	The lead facilitator will access patient charts weekly to identify a total number of patients seen for postpartum care and if an order was placed. Discussions with staff if gap in care is noted.	The percentage of patients with GDM who receive a 2-hour gtt during their postpartum care divided by a total number of postpartum patients with identified GDM diagnosis. Discussions with staff if gap in care is noted.

Table 3: Long-term goals

SMART Goal #1: At least 75% of patients with GDM will receive an order for a 2-hour 75g glucose tolerance test between 2 and 6 weeks postpartum		
- Smart phrase in EHR will serve as a prompt to assess the chart for diagnosis - The nursing workflow sheet will serve as a reminder to place an order during the 2-week postpartum visit and educate the patient on the recommended timeline for completion - Staff education will increase awareness of guideline recommendations and screening		
Data to be collected	Collection Process	Planned data analysis

Table 3 Continued.

Number of patients with GDM who receive an order for a 2-hour gtt (numerator) and the total number of postpartum patients with GDM (denominator)	The lead facilitator will assess charts weekly through the six-week implementation period	Divide the number of patients with GDM diagnosis who receive a 2-hour gtt hour by the total number of postpartum patients with GDM. A total number of patients who have GDM who are educated at two week visit compared to 6 week visit, compared to those who receive no education or screening at either postpartum encounter.
SMART Goal #2: Staff will verbalize an understanding of ADA and ACOG guideline recommendations and current unit screening adherence.		
- An end of project survey will be completed to assess for effectiveness and recommendations for change. - The ongoing QI process will continue with postpartum identification of GDM and screening for T2DM.		
Data to be collected	Collection Process	Planned data analysis
Survey of at least 90% of staff involved in implementation.	The lead facilitator will verbally survey staff for the effectiveness of the implementation	Evaluate if the percentage of goals were achieved. What unexpected barriers were identified by staff members?

Organizational Microsystem Assessment

The microsystem of the proposed project site is a women's specialist clinic providing comprehensive care for women across the lifespan. This includes routine gynecologic care, prenatal care through obstetricians and certified nurse midwives, postpartum care, urogynecology care, and specialized breast care for female patients of all ages. The clinic is associated with a larger accredited non-profit healthcare system that serves southwest Montana with approximately 126,000 local community members, along with thousands more from the surrounding rural

communities. Its unique location allows the clinic to serve rural communities, as comparable healthcare centers are located two to four hours away.

The clinic is staffed by several obstetrical providers, comprising eight OB-GYN physicians, four certified nurse midwives (CNM), three family nurse practitioners (FNP), and one physician's assistant (PA-C). Clinical operations are overseen by two registered nurses, while the remainder of the clinic staff includes registered nurses and medical assistants who deliver direct patient care. Additional staff, such as a behavioral health resource navigator, clerical staff, and patient support staff contribute to the clinic's operations, although they do not engage in direct clinical care. On average, the clinic serves approximately 150 patients daily across various subspecialties. Notably, the affiliated hospital provided care to 689 laboring mothers, 60% of whom are patients of this clinical group. This data underscores the clinic's significant role in the obstetrical care continuum, highlighting its contribution to maternal health within the community.

Qualitative interviews conducted with stakeholders revealed varied workflow processes to recognize unique patient identifiers, depending on the phase of care. Healthcare providers (e.g. obstetricians, midwives, FNPs, and PAs) along with nursing staff, rely on collaborative efforts to facilitate ordering of necessary prenatal tests, imaging studies, and laboratory work. Several nurses utilize clinic-provided workflow sheets intended to serve as quick reference tools for necessary screenings and healthcare maintenance tasks during specific various stages of pregnancy. Additionally, providers, nurses, and medical assistants frequently utilize a resource within the EHR called "the pink sticky note", which serves as a reference for a diagnosis of Gestational Diabetes in the context of planning postpartum care. Two-week postpartum visits are

most often overseen by the FNP, who may be caring for the patient for the first time during their prenatal care, while the delivering provider is often scheduled to conduct the patient's follow-up appointment at the six-week visit.

While some nursing staff reported a knowledge and understanding of the significance and necessity of consistently ordering the 2-hour glucose tolerance test during the six-week postpartum visit, roughly half indicated that this test was not routinely included in their screening. Healthcare providers reported that their planning for postpartum care relied on various resources, including the most recent History of Present Illness (HPI), the "pink sticky note", and the nursing report. Although FNPs reported discussing the glucose tolerance test with patients during their two-week visit if prompted to do so, many patients expressed a knowledge deficit regarding their risk of developing Type 2 Diabetes Mellitus following childbirth.

In accordance with clinical protocols, all patients who test positive for Gestational Diabetes during pregnancy are referred to the Maternal Fetal Medicine (MFM) team. This referral encompasses comprehensive diabetes education, consultations, and additional fetal monitoring alongside their routine prenatal care. In a review of all patients seen by the MFM team from January 1, 2024 to June 1, 2024, 41 patients were identified to have GDM, only 18 patients were issued an order for the 2-hour glucose tolerance test during the postpartum phase. Additionally, eight of the 41 patients did not return for any postpartum follow-up. Therefore, of the patients who attended routine postpartum check-ups, 54.5% received the recommended screening test. This assessment highlights a significant gap in the current care pathway, underscoring the need for a quality improvement initiative focused on increasing screening for Type 2 Diabetes in postpartum women diagnosed if GDM. The primary obstacle identified is the

absence of a standardized workflow for the identification of patients with GDM during the postpartum period.

Quality Improvement Framework

The Institute for Healthcare Improvement's (IHI) Model for Improvement was chosen as the foundational framework for this quality improvement project due to its emphasis on ongoing and continual assessment and re-implementation of change. This framework focuses on enhancing the quality of healthcare delivery to patients. The Plan-Do-Study-Act (PDSA) cycle is a simple yet effective framework that allows for continuous evaluation and refinement of interventions to effectively achieve the project's stated aim.

When planning a quality improvement project, the IHI Model for Improvement starts by emphasizing the importance of three questions: What are we trying to accomplish? How will we know if a change was an improvement? And what change can we make that will result in improvement? This quality improvement project seeks to increase rates of postpartum screening for Type 2 Diabetes Mellitus in women with a diagnosis of GDM during their pregnancy. Improvement will be evaluated by measuring the percentage of patients who receive an order for a 2-hour 75g glucose tolerance test during their postpartum care visits. A microsystem analysis has been conducted to address the third question, revealing gaps in care and workflow processes among the healthcare staff who provide direct patient care to postpartum patients. The fishbone diagram in [Appendix C] delineates the various barriers that staff encounter in placing the correct screening order for the patients during postpartum care encounters.

The Plan-Do-Study-Act (PDSA) cycle was then utilized as a framework for the development of the project concept. In the "plan" step, data gathered during site assessments

identified the clinic lacked a standardized protocol for the evaluation of patients for a diagnosis of GDM during postpartum encounters. Consequently, a specific aim was created to guide the project, specifically describing the goals and expected outcomes as well as to measure the success of the quality improvement project. To address this identified gap, an intervention was created to include staff education, the implementation of a universal postpartum smart phrase in the EHR, and the revisions of nursing workflow sheets. These interventions are supported by evidence acquired during the literature review. The plan was thoroughly reviewed and received approval from site representatives during stakeholder meetings. A multidisciplinary team will be assembled to include all nursing and clinic rooming staff, obstetrical providers, including physicians and midwives, and FNPs who often provide care during 2-week postpartum care follow-up encounters.

In the “do” step, the lead facilitator will conduct a comprehensive staff education session on the current guidelines and recommendations from the ADA and ACOG regarding the 2-hour 75g postpartum glucose screening. This session will also introduce the new smart phrase for use in the EHR and present the updated nursing work flowsheet that incorporates postpartum screening tests. Throughout the execution of the project, the lead facilitator will carry out continuous weekly assessments to evaluate the effectiveness of the interventions, address any problems with implementation, and document any unexpected outcomes.

During the “study” step, the data collected over the six-week implementation period will be systematically analyzed. The lead facilitator will assess the number of patients with a GDM diagnosis who were accurately identified during postpartum encounters, as well as the number of those who received the recommended 2-hour 75g glucose tolerance test, then divide the numbers

by the total number of GDM patients who accessed postpartum care within the specified timeframe. The insights derived from the data and analyzed will inform the effectiveness of the interventions, capture staff perceptions regarding the ease of implementation, and facilitate reflections on potential improvements in the process. The findings from the “study” phase will directly inform the subsequent final “act” phase. In this final step, the summarized data will be utilized to identify necessary changes to improve workflow, enhance care quality, and inform modifications for future additional implementation cycles within the clinic. Through this iterative process, the project aims to systematically improve postpartum care for patients with GDM.

Implementation Summary

The proposed QI project aims to increase postpartum screening for women at increased risk of developing T2DM following pregnancies complicated by GDM. This project will be implemented from January 2025 to March 2025 and will take place at a women’s specialist clinic in Southwest Montana, which serves suburban and rural populations. The project has received approval from key stakeholders and site leadership upon identifying a significant quality gap in current practices. The target participants include pregnant women diagnosed with GDM who will receive postpartum care within the six-week intervention period. Additionally, all healthcare staff providing direct postpartum care (e.g. to physicians, midwives, nurse practitioners, nurses, and medical assistants) will be integral to the project. Patients who do not attend their postpartum follow-up appointments will be excluded from both the nursing intervention and subsequent evaluation. The QI project will specifically focus on increasing the postpartum screening process in accordance with the guidelines set forth by the ADA and ACOG. The clinic already utilizes a 2-hour 75g glucose tolerance test as part of its standard practice. To facilitate improvement,

clinic staff will adapt changes to nursing workflow to better identify patients with a GDM diagnosis, ensuring the appropriate laboratory test is ordered during the scheduled postpartum visit. Evaluation metrics will focus on both the ease of implementation and the percentage of patients diagnosed with GDM who receive an accurate order in the EHR. This project seeks not only to address a critical gap in postpartum care but also to improve the management of women's health post-delivery.

Interventions and Implementation

Current guidelines from the ADA and the ACOG recommend screening women between four and twelve weeks postpartum with a 2-hour 75g glucose tolerance test to assess the persistence of glucose intolerance following delivery. Despite knowledge of these guidelines, it has been observed the clinic site orders the appropriate test only 54.5% of the time for patients attending their postpartum follow-up visits. This project aims to improve nursing workflows to systematically identify patients with a history of GDM who seek postpartum care, which was identified as the predominant barrier to the timely ordering of the recommended glucose tolerance test.

To address the identified quality gap in postpartum care, we propose the development and implementation of a standardized postpartum smart phrase for use by all rooming staff during both two-week and six-week postpartum visits. This smart phrase will encompass standard postpartum screening questions pertaining to bleeding, contraception, infant feeding, and maternal mood, all also incorporating an assessment for GDM. In cases where GDM is identified during the rooming process for a patient's two or six-week postpartum visit, clinic staff,

including the nurse, MA, or healthcare provider, will order a 2-hour 75g glucose tolerance test to be completed between four and twelve weeks postpartum.

The implementation of a universal smart phrase, alongside a revision of a nursing workflow sheet widely utilized by the rooming staff in the clinic, serves as a crucial enhancement to the practice. The updated workflow sheet will now include postpartum screening for GDM and will correct the currently absent testing orders. All changes and additions to flowsheets and the smart phrase will undergo a thorough evaluation and obtain approval from site leadership prior to implementation.

To facilitate the transition, clinic rooming staff, including nurses and medical assistants, will receive comprehensive in-person education on the current guideline recommendations, clinic ordering rates, and the strategic plan for implementation prior to the designated start date. Attendance will be monitored and measured by the site facilitator with a goal to achieve 90% attendance prior to initiation (see short-term SMART goal #2).

Timeline

The QI project will be implemented over a six-week period between January 2025 and March 2025. Figure 2 outlines the expected tasks and assessments from September 2024-March 2025 when the project is expected to be completed.

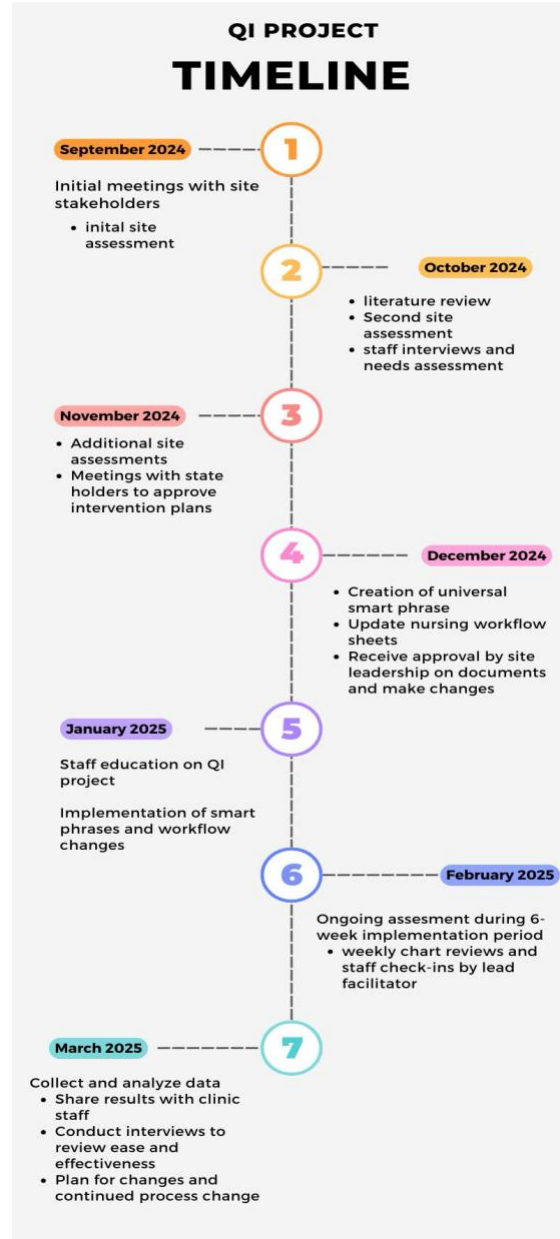


Figure 1: QI project timeline

Eligibility

All staff who engage in direct patient care are eligible for participation in the project and will be utilized as part of the team. The rooming staff includes registered nurses and medical assistants, while the billing providers include physicians, midwives, a physician assistant, and

nurse practitioners. Eligible patients will include women diagnosed with GDM during their current pregnancy who receive postpartum care within the six-week implementation period. Women who do not follow up for postpartum care will not be evaluated for receiving the correct screening orders.

Barriers

Anticipated barriers to adherence include insufficient knowledge of current guideline recommendations and clinic performance metrics, the implementation of a new smart phrase not previously used by staff members, concerns regarding high-risk patients during clinical appointments, and staff resistance to adopt and implement a process change. These barriers will be addressed through a comprehensive educational program prior to the implementation date, supplemented by weekly chart reviews and staff interviews when non-adherence is noted. Furthermore, active engagement from site leadership will be integral to facilitating involvement.

Evaluation and Analysis

Data collection

Data collection will be conducted by the lead facilitator, utilizing The Data Tracking Form [Appendix B] on a weekly basis. This form will assess for utilization of smart phrases during postpartum visits, verify the accurate identification of patients with a diagnosis of GDM, and assess the percentage of patients receiving orders for the correct screening testing, in alignment with the above SMART goals: Medium-term #1 and #2, long-term #1. At the completion of the six-week intervention period, the total number of correctly identified patients who have a diagnosis of GDM, the total number of patients who received the correct screening

testing, and the total number of patients with a diagnosis of GDM who received postpartum care will be divided and compared to the projects aim and previous ordering adherence rates. Staff interviews will be conducted weekly, as well as at the completion of the project period, focusing on ease of use, adherence to protocols, and potential areas for improvement. Descriptive statistic methods will be used to analyze the collected data.

Medium term goals, including staff adherence to the smart phrase usage and ensuring patients receive the correct order during their postpartum visits, will be measured as previously stated. If these medium terms are not achieved, the lead facilitator will discuss with staff members to identify barriers to adherence and implement necessary changes, which will likely involve additional education initiatives.

Long term SMART goal #1 aligns with medium-term SMART goal #1, with the added objective of measuring staff knowledge regarding guideline recommendations and tracking adherence results following the implementation period.

Safety and Confidentiality

Prior to implementing the quality improvement project, a DNP project proposal will be submitted to Montana State University's Institutional Review Board (IRB) for ethical review in November 2024. Approval will be obtained from key stakeholders and site leadership to ensure alignment with institutional standards. All staff within the clinic will undergo comprehensive training on the Health Insurance Portability and Accountability Act (HIPAA), with verification processes in place to confirm that the staff are current with the required training. Strict measures will be in place to protect patient confidentiality and privacy throughout the project.

Initial data collection will be conducted through a thorough chart review, after authorized by site leadership, and will take place in a secure, private location on site. Upon completion of the initial data collection, all documentation containing patient identifiers will be securely destroyed on site, ensuring that no unique patient identifiers were transcribed outside of the electronic health record. During the implementation phase, access to patient data will be restricted to staff engaged in direct patient care. Weekly chart reviews will be performed exclusively by the lead facilitator or designated site leadership; no unique patient identifiers will not be transcribed on the Data Tracking Form [APPENDIX B]. The data collected will specifically pertain the diagnosis of GDM and the presence of a 2-hour 75g glucose tolerance test.

Upon completion of the comprehensive chart review conducted on site and without the use of unique patient identifiers for data collection, this quality improvement project presents no additional risk of a HIPAA breach beyond those inherent to the patient's direct care team and the lead investigator.

CHAPTER THREE

QUALITY IMPROVEMENT MANUSCRIPT

Contribution of Authors and Co-Authors

Manuscript(s) in Chapter(s) 1

Author: Hailey Rae Milligan

Contributions: The author identified the clinical problem, reviewed the literature, synthesized research outcomes, and implemented a study protocol. After the implementation period, the author collected and analyzed the data using statistical methods to complete the first draft of the manuscript.

Co-Author: Dr. Anne Brown

Contributions: Dr. Brown provided consistent expert advice on writing style and synthesizing data, and helped guide the focus of the quality improvement project. She conducted repeated editorial reviews resulting in a completed manuscript.

Co-Author: Dr. Carrie Miller

Contributions: Dr. Miller played an essential role as second reader. She provided expert feedback through a comprehensive editorial review on structure, grammar, and flow of the final manuscript.

Manuscript Information

Author: Hailey Rae Milligan Co-Authors: Dr. Anne Brown and Dr. Carrie Miller

Increasing postpartum screening in women with Gestational Diabetes at risk for developing Type Two Diabetes Mellitus

Status of Manuscript:

☒ Prepared for submission to a peer-reviewed journal

☐ Officially submitted to a peer-reviewed journal

☐ Accepted by a peer-reviewed journal

☐ Published in a peer-reviewed journal

Clinical Problem

Diabetes Mellitus is a chronic disease characterized by significant morbidity and mortality, with an estimated prevalence of nearly 15% among the U.S. adult population (CDC, 2024). Gestational Diabetes Mellitus (GDM) is a type of diabetes that affects women during pregnancy. Most often believed to resolve after delivery, however up to 60% of women diagnosed with GDM may develop T2DM within ten years following delivery (AHRQ, 2008). While T2DM is highly influenced by lifestyle habits, social determinants of health, and other chronic conditions, many patients are unaware they have developed T2DM until medical management is necessary. This lack of awareness can result in end-organ damage, including blindness, neuropathy, kidney disease, peripheral vascular disease, cardiovascular disease, hearing loss, and amputation of limbs (ADA, n.d.). Therefore, understanding the long-term impact of GDM and the necessity for ongoing monitoring is critical in reducing the risks associated with T2DM.

To address this problem, the American Diabetes Association (ADA) and the American College of Obstetrics and Gynecology (ACOG) recommend screening women with a diagnosis of GDM during pregnancy for T2DM using a 75g, 2-hour glucose tolerance test (gtt) within 4 to 12 weeks postpartum. While screening rates for GDM during pregnancy are as high as 90%, postpartum screening rates for T2DM are reported between 10 to 50% (Bauer et al, 2023). In addition, patients at the highest risk for not completing the recommended screening include those with low health literacy, communication barriers, lack of childcare or transportation, and insured by Medicaid (SMFM, 2023).

Rural, non-white, and low-socioeconomic status patients are disproportionately affected by both GDM and T2DM. In Montana, 44% of the population resides in rural areas, and 50% of counties are considered healthcare deserts (March of Dimes, 2023; Montana Legislature, n.d.). Consequently, women in Montana are at an increased risk for not receiving proper prenatal care, postpartum diabetes screening, adequate annual screening, and surveillance through a primary care provider once they have completed childbearing. Montana's unique risk factors require healthcare providers in this state to assess and identify quality gaps in care to better educate, screen for, and prevent the development of chronic disease in women.

Review of the Literature

Evidence-based practice changes

While many studies focused on patient-centered educational interventions, there was rarely a statistically significant impact on screening adherence. Rather than focusing on patient specific interventions, a study by Stretlow et al. found that screening rates increased when active orders are placed, and patients are notified (2023). This intervention puts a responsibility on the provider to make sure testing is ordered as recommended, and patients are educated about testing recommendations in real time. In addition, patient screening adherence increases after implementation of provider-based educational models and electronic reminders within the EHR (Soffer et al., 2017; Amason et al., 2016).

While patient centered education is necessary, the research found that solely focusing on patient-centered interventions is not enough to change outcomes in a significant way. A study by Hamel and Werner found that despite proactive patient centered education in the third trimester, adherence rates were only increased to 71% (2017). Amason et al. found that despite educational

interventions, patient perception on their perceived or genetic predisposition for developing T2DM was unchanged by teaching and heavily influenced their decision to complete recommended screening (2016).

Conceptual Framework

The Institute for Healthcare Improvement's Model for improvement was utilized to design a conceptual framework for the quality improvement project. To begin, three simple questions were answered: What are we trying to accomplish? How will we know if a change was an improvement? And what change can we make that will result in improvement?

During the plan phase, a microsystem assessment was completed in a local women's specialist clinic in southwest Montana, identifying a quality gap in diabetes screening for postpartum patients with GDM. It was found that despite adequate patient education and prenatal screening for GDM, only 54% of patients received the correct 2-hour, 75g glucose tolerance test order during their postpartum care encounters. Interventions focused on staff education, reminders, and smart phrase templates in the EHR were proposed to and approved by key stakeholders for implementation. Based on the evidence, the interventions chosen included:

1. Education provided to staff who participate in rooming of patients on current ADA and ACOG guidelines for screening, current unit screening adherence, and intervention recommendations.
2. Implementation of a universal smart phrase to be used within the EHR during the rooming process to help prompt staff to identify postpartum patients with a recent diagnosis of GDM.

3. Update to the “common labs” from to include postpartum screening for GDM, available at each nursing station for quick reference and reminder.

The multidisciplinary team included nursing leadership, registered nurses, medical assistants, physicians, certified nurse midwives, and family nurse practitioners.

During the “Do” phase, a six-week implementation period was chosen to conduct interventions after completion of staff education. The implementation period spanned from January 27th, 2025- March 7th, 2025. Weekly chart audits were performed by the lead investigator to gather adherence data.

The “study” phase was ongoing throughout the implementation period and was conducted comprehensively upon the completion of the six-week phase. Descriptive statistics were utilized to analyze and interpret the data, including usage of the universal smart phrase and the percentage of patients with GDM who received the correct 2-hour, 75g gtt during their two- or six-week postpartum visits. As this QI project focused on provider-focused interventions, patient screening adherence was not evaluated. Additionally, qualitative interviews with staff members were conducted to assess the ease of implementation and identify areas for improvement.

In the final phase of the PDSA cycle, healthcare providers have the option to utilize data collection to initiate additional cycles of improvement, as deemed necessary by the multidisciplinary team and stakeholders to continue to meet goals. The iterative process allows for continuous refinement and alignment with the established goals.

Aim Statement

The ADA and ACOG recommend that patients diagnosed with GDM during pregnancy undergo a 2-hour, 75g glucose tolerance test between 4 and 12 weeks postpartum. However, despite recommendations, only 54% of patients with GDM have had this screening ordered by their obstetrical provider. This project aims to increase the rate of postpartum screening for T2DM from 54.5% to 75% by March 2025.

Methods

Context

The project site was a women's specialist clinic located in southwest Montana, which serves approximately 800 pregnant patients annually, encompassing both a local urban population and surrounding rural communities. The multidisciplinary team included obstetricians, certified nurse midwives, family nurse practitioners, registered nurses, and medical assistants who provide direct patient care. Eligibility criteria included all postpartum patients who received postpartum care for their two and/or six-week visits within the implementation period and who had a diagnosis of GDM during their pregnancy. Additionally, there was no extra cost incurred by the clinic, as the recommended 2-hour, 75g gtt was an established and routinely utilized test by the clinic prior to the implementation of this project.

Intervention

Following the approval of stakeholders, a staff education session was conducted for nurses and medical assistants one week prior to the project's initiation. The training included a

review of current screening recommendations from the ADA and ACOG, as well as an analysis of current site adherence rates and the objectives of the project.

In the discussions, emphasis was placed on reducing the development of chronic disease and enhancing patient health literacy. Staff members were introduced to the proposed interventions, which included the implementation of a universal postpartum smart phrase for rooming encounters and an updated common labs form. Both interventions were designed to improve visual cues for rooming staff, thereby creating more consistent and standardized opportunities to identify patients with GDM, so that the correct screening test could be ordered by the provider. During the microsystem assessment, staff expressed concerns regarding the absence of a standardized workflow for identifying GDM diagnoses during postpartum visits.

Following the education session, an email was sent to all staff members containing the universal smart phrase. Additionally, the updated common labs form was replaced in all nursing workstations for ease of access, and the correct lab code for the 2-hour, 75g gtt was provided for staff reference. The implementation start date of January 27th was communicated and acknowledged by the rooming staff members prior to the project's implementation.

Once the project was initiated, staff were encouraged to contact the lead investigator with any concerns related to the use of the smart phrase and the identification of patients with GDM receiving postpartum care.

When a patient was identified as having a recent diagnosis of GDM, the rooming staff member notified the provider, who then ordered the correct 2-hour, 75g gtt in the EHR. Additionally, the patient was educated about the purpose and significance of the test.

Measures

Interventions were evaluated and measured against established medium and long-term SMART goals through weekly data collection conducted by the lead investigator, following the completion of staff education and the dissemination of the updated common labs form. SMART goals included:

1. The universal smart phrase will be utilized in 90% of all postpartum visits during the implementation period.
2. At least 75% of patients diagnosed with GDM will have an order for the 2-hour, 75g gtt placed during either their two or six-week postpartum care encounters.

During the data collection process, the lead investigator utilized the Data Tracking Form to collect evidence. Each postpartum visit was assessed for a diagnosis of GDM based on either the results of the initial prenatal glucose tolerance test results and/or the History of Present Illness (HPI) documented at the time of delivery, as well as the utilization of the universal postpartum smart phrase during the rooming encounter(s). If a patient was identified as having a diagnosis of GDM, their medical chart was assessed for the correct 2-hour 75g gtt order. To ensure confidentiality, all patient identifiers were omitted from the data collection process, and the chart reviews were conducted on-site in a secure location.

Analysis

Upon completion of the six-week implementation period, all collected data was compiled and analyzed using descriptive statistics. The data measured included the total number of postpartum patients diagnosed with GDM who received the correct screening test, as well as the total number of visits where the universal postpartum smart phrase was utilized for all

postpartum patients. Descriptive statistics served as the most effective and informative method for analyzing this data.

Given that the utilization of the postpartum smart phrase was lower than expected, qualitative interviews and open-ended questions were employed to identify areas necessitating improvement to enhance compliance and participation among staff.

Results

During the six-week implementation period, a total of 154 postpartum patients received care during either their two or six-week postpartum visits, of which 3.9% (n=6) were diagnosed with GDM during pregnancy. Among the six patients with GDM, five were correctly identified and received the correct 2-hour, 75g gtt during their visit. However, only one of the six patients with GDM was identified through the utilization of the universal smart phrase.

In relation to SMART goal #1, only 16% (n=24) medical charts indicated the use of the universal postpartum smart phrase for screening. In contrast, for SMART goal #2, 83% of patients diagnosed with GDM were correctly identified during their postpartum visits and received the correct screening test, representing an increase from 54% prior to implementation of the project.

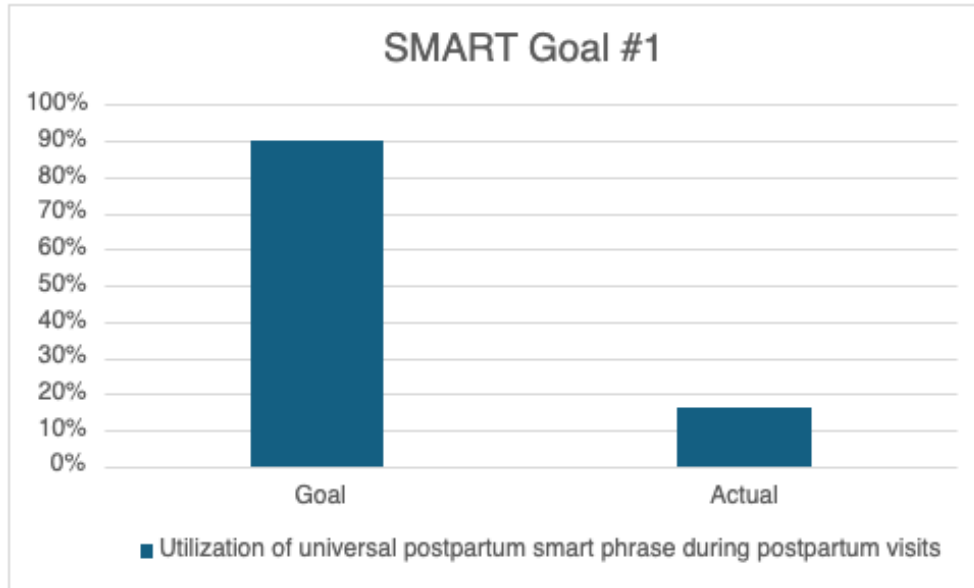


Figure 2: SMART Goal #1: Utilization of universal postpartum smart phrase during postpartum visits

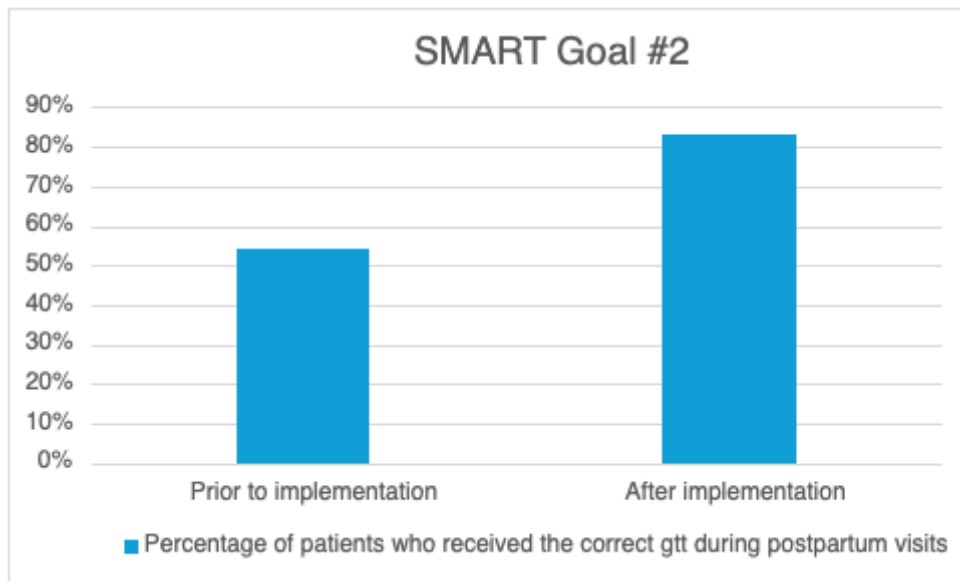


Figure 3: SMART Goal #2: Percentage of patients who received correct gtt during postpartum care

Discussion

During the implementation of the quality improvement project, SMART goal #1, which stipulated that the smart phrase would be utilized in 90% of all postpartum visits, was not met. Following the six-week implementation, qualitative interviews were conducted with nursing staff to identify barriers to usage. Rooming staff were asked two questions: “Why or why not was the universal postpartum smart phrase useful for identifying patients with GDM during postpartum visits?” and “Given the low usage of the postpartum smart phrase, what do you think contributed the most to the increase in patients with GDM who received the correct gtt order?”. A random sample of nursing staff, including twelve registered nurses, participated in interviews.

Two prominent themes emerged: provider preference and nursing preference. Nurses reported that the use of a smart phrase during the rooming process was not incorporated into their workflow because providers often did not reference rooming notes, or that the assessment for GDM was incorporated into personal smart phrases used by nurses. Overall, nursing staff perceived the universal smart phrase as cumbersome to their routines and indicated that personal and provider preferences contributed to its underutilization during the implementation period.

Many staff members identified the nursing educational session as the significant factor in improving the identification of patients with GDM during postpartum encounters. One nurse noted a lack of awareness regarding guideline recommendations prior to the educational session, while others reported that the session served as a valuable reminder to screen for GDM in postpartum patients. Additionally, all rooming staff interviewed identified that updated Common Labs Form as a useful visual reminder. Given these results, staff education appeared to have the

biggest impact on achieving SMART goal #2, increasing the percentage of patients who received the correct 2-hour, 75g gtt during either their two- or six-week postpartum visit.

All staff interviewed reported a better awareness of the ADA and ACOG guidelines for postpartum diabetes screening, felt they were now better equipped to identify patients with GDM, and communication with the provider to order the correct screening test was improved.

Limitations

The most significant limitation of the quality improvement project was the lack of integration of reminders within the EHR, which were identified as most impactful for enhancing provider-specific interventions aimed at increasing adherence to ordering protocols and improving patient identification. There are over fifteen different ICD-10 diagnoses associated with GDM, creating challenges for providers in leveraging the EHR to facilitate accurate identification.

Although the use of the universal smart phrase was intended to standardize workflows, it failed to accommodate individual preferences of healthcare providers during patient care. The level of nursing buy-in greatly impacted the utilization of the smart phrase, despite the project successfully achieving its overall aim of increasing the number of patients who received the correct glucose tolerance test order during postpartum visits.

Additionally, the small sample size and short implementation period also limit the generalizability to a larger population. The percentage of patients identified with GDM during the implementation period was 3.9%, which is below the national average of 6-10%.

Furthermore, since the intervention focused on identifying patients during either their two or six-

week postpartum visits, some patients screened had not completed their postpartum care by the time of final data collection.

Recommendations

The evidence presented in the literature review supports provider-based educational interventions among the most effective in improving adherence to screening protocols and ordering rates (Soffer et al., 2017; Amason et al., 2016). This finding was also reiterated through the qualitative reviews with nursing staff. Future QI projects should prioritize staff education, as it has demonstrated a significant impact on enhancing ordering adherence among nurses and providers. An extended evaluation to identify the necessary frequency of educational interventions should be conducted, as it remains unclear how long a single educational intervention would be sufficient to sustain elevated identification and ordering rates as high as noted during this six-week intervention period.

In terms of integrating EHR reminders, this QI project found that individual changes to nursing workflows had minimal impact on both staff adherence and achieving the project's aims. Literature suggests alternative strategies for addressing provider-level reminders within the EHR. These may include the development of order-sets designed for patients with GDM upon discharge from delivery, as well as the incorporation of integrative links in provider notes to prompt the ordering of necessary tests based on specific ICD-10 codes and diagnoses.

Future research may benefit from further collaboration during the planning phase. Engaging nursing and provider focus groups may help facilitate the identification of standardized workflows that could yield higher rates of staff buy-in compared to the previously utilized universal smart phrase. Site assessments should be tailored to the unique needs of institutions.

While this QI project focused on improvements at the staff and provider-levels, the decision-making process was informed by the comprehensive education provided to patients with GDM throughout their pregnancies. In contrast, departments lacking specialized services may find more significant gaps in quality of patient education and health literacy.

The literature review also highlighted the importance of addressing patient-level factors to increase screening compliance. While many QI interventions were limited by patient perceptions and the cumbersome nature of the glucose tolerance test, future recommendations may include screening patients immediately postpartum prior to their discharge. Providers involved in postpartum care should remain up to date on current literature as more flexible options for patient care emerge.

Finally, QI projects within a primary care setting may include additional screening reminders for women with prior pregnancies who do not yet meet recommendations for diabetes screening. This strategy would assist in identifying patients who either did not receive adequate prenatal education, failed to undergo postpartum screening, or did not adhere to recommendations from obstetrical providers.

Conclusion

The overall goal of this QI project in primary care is to reduce the development and complications associated with chronic diseases. Achieving this goal necessitates ongoing assessment of adherence to clinical guidelines, timely updates to recommendations, and a commitment to implementing practice change. Without these measures, both patients and providers will struggle to improve health outcomes.

A consistent commitment to screening for and identifying transitions from GDM to T2DM can yield significant, positive impacts for population health and economic stability. Early identification of disease through collaboration with obstetrical providers enables effective management of diabetes in primary care settings, thereby reducing the risk of severe complications, including end-organ damage, blindness, kidney disease, heart disease, neuropathy, and limb loss. Furthermore, primary care providers should prioritize screening female patients with obstetrical histories for a diagnosis of GDM, as this approach can enhance the identification of patients who may not have received adequate education regarding their risk of developing T2DM later in life.

This quality improvement project highlights the importance of multidisciplinary collaboration within healthcare settings to identify and address quality gaps in patient care. Often, effective solutions require a continuous process of assessment and reimplementation to achieve sustainable and lasting improvements to care. As populations grown and evolve, it is imperative that healthcare providers and clinical guidelines adapt accordingly.

CHAPTER FOUR

ADVANCED NURSING ESSENTIALS REFLECTION

Introduction

Since 1986, the American Association of Colleges of Nursing (AACN) has published essentials to guide the development of advanced practice nursing programs (2021). These essentials aim to guide the framework institutions use in developing programs where nurses are provided opportunities to learn and practice being leaders in their fields, focusing on diversity, equity, and inclusion, systems-based practice, information technologies, engagement and experience, and developing career-long learning objectives. Throughout the last four years, Montana State University has provided an opportunity for nurses to focus on these essentials, both academically and practically in community-based settings. The next section will reflect on a few specific essentials and how they have worked to inform my practice as a doctorally-prepared Family Nurse Practitioner.

Essential I: Knowledge for Nursing Practice

This first essential focuses on the specific scientific underpinnings of practice, where a bachelor-prepared nurse grows into an advanced practice provider with the skills to take her knowledge and experience of basic anatomy and physiology and patient-centered care and transforms them to make evidence-based clinical treatment decisions.

I have been afforded countless opportunities to advance my clinical nursing knowledge as I have progressed through Montana State University's DNP program. Course work in both the Statistical Applications and Evidence Based Practice courses taught me to critically read research

and how to prioritize data from peer-reviewed sources. Design of Healthcare Systems introduced a creative viewpoint as to how our environments and buildings impact the health of our patients. Financing and Budgeting of Healthcare Systems showed me how to practically assess and build a budget for desired practice changes. Altogether, the combined course work prepared me for the design and implementation of a quality improvement (QI) project which focuses on improving healthcare delivery to vulnerable populations while focusing on long-term health consequences of untreated chronic conditions. While my nursing knowledge taught me to collaboratively identify patients at risk for developing T2DM, my advanced practice education has shown how interprofessional collaboration in healthcare needs to be intentional and consistently pursued to reach desired health outcomes.

Coursework including Advanced Pharmacology, Advanced Pathophysiology, and Diagnostic Reasoning prepared me for clinical rotations where I was afforded a diverse patient population to assess, diagnose, and formulate treatment plans in collaboration with healthcare providers. Direct patient care consistently fine-tuned my theoretical understanding of pathognomonic vs clinical disease presentation, encouraging an individualized treatment approach for each patient.

Essential II: Person-Centered Care

The development of providing person-centered care focuses on establishing relationships, effective communication, assessment and diagnostic skills, evaluating outcomes, promoting self-care, and providing care coordination (AANC, 2021). Course work in Advanced Nursing Leadership and Vulnerability and Healthcare in Diverse Communities focused heavily on the assessment and implementation of social determinants of health (SDOH) when applied to

evidence-based practice (EBP). I might argue, it is impossible to fully provide EBP without doing so. Advanced practice nurses have the unique opportunity to build on a nursing skills including bedside caregiving, development of rapport, obtaining correct background and historical information, and apply these skills to person-centered treatment modalities. MSU's DNP program focused heavily on the concept of shared decision making (SDH), where healthcare providers expand beyond their ability to diagnose and treat, to learning how to have discussions with patients regarding evidence-based treatment recommendations with their personal preferences. I learned both through literature reviews and direct patient contact, that adherence to treatment regimens greatly increases when patients understand why a specific course was chosen and were included in the decision-making process. An example is when I recommended antibiotics to treat acute otitis media in pediatric patients greater than two years old. Guideline recommendations offer both prompt antibiotic coverage along with watchful waiting, depending on specific patient qualifiers. I found that when options were presented to parents, mutual respect and understanding was achieved sooner than when recommendations are not discussed. The pediatric population is especially complex as the provider must build rapport with both the child as well as the caregiver. My clinical rotations taught me nuances to building relationships with families, especially when expectations are present prior to a diagnosis.

Providing care to geriatric patients offers an additional unique opportunity to build rapport and provide care coordination, both elements regarded within this essential. Older adults are often on more medications, at risk for polypharmacy, and more agreeable to treatment regimens than other age groups, therefore they present an opportunity to assess patient specific barriers to care including financial, transportation, cognition, and functional concerns. All need

to be considered prior to formulating a treatment plan and often require significant collaboration between interdisciplinary teams. The clinical courses provided by MSU complimented my experience caring for patients in correctly diagnosing problems, identifying various treatment modalities, and presenting options to patients for shared decision making and follow up.

Person-centered care may be one of the most important DNP essentials that will inform my practice as a Family Nurse Practitioner. As discussed throughout this QI project, fragmentation of healthcare has led to highly specialized viewpoints, often not allowing providers to accurately protect patients from their own unique risk factors. An obstetrician may assume the primary care provider will screen for diabetes, while the primary care physician may not fully review current or remote obstetrical histories. This QI project has provided an opportunity to identify at risk patients prior to their discharge from specialty. It allowed me to identify evidence-based practice guidelines with unit specific quality gaps to better educate patients. While adherence to recommended postpartum glucose testing is recorded low nationally regardless of QI interventions, the project allows for opportunity to patients to complete screening and give informed consent.

Essential V: Quality and Safety

The essentials of practice knowledge and person-centered care help the advanced practice nurse diagnose and compassionately treat patients, however the overarching essential of Quality and Safety are always at the forefoot of our minds as we navigate healthcare delivery. Regardless of provider or patient preference, the provider has the responsibility to provide safe care. Every clinical course within the MSU DNP program has focused on the delivery of safe, high-quality care. Quality is both subject to patient perception, as well as evidence-based research. With the

high cost of healthcare delivery for both the consumer and provider, elements of efficiency, timeliness, and accuracy all play a role.

Clinical rotations gave me ample opportunities to practice providing safe, high-quality care in difficult situations. This was most often notable when patients would present for acute visits, requesting or hoping for an antibiotic prescription. Being able to navigate conversations surrounding antibiotic stewardship and recommendations was not infrequently met with resistance when given a viral diagnosis. I was able to learn how to inquire for patient preferences, discuss specific assessment findings, and give education on expected course of illness, red flags for when to return or seek higher levels of care, and assess for understanding, all within a short acute visit.

As a Family Nurse Practitioner, I believe this essential will provide the foundation for all healthcare delivery. While each essential feels cumbersome to discuss individually, my time at MSU has taught me that all go hand in hand. I cannot be safe without nursing knowledge. I cannot provide quality care without shared decision making. Each semester has thoughtfully built upon each block, where now these essentials feel imbedded in how I view myself as an advanced practice provider.

Essential X: Personal and Professional Development

Providing safe, high quality, and patient-centered care consistently takes practice and forethought, especially in an ever-changing medical field. Patients deserve to have the expectation that the treatments they receive are the most recent, evidence-based recommendations available. During my time at MSU, I found that this is often achieved through the development of collaborative relationships, ownership over continuing education, and guided

by my own self-care habits. Nurse practitioners have the unique opportunity to model a different work-life balance than other healthcare professionals are able to. Many coming from backgrounds with a wealth of experience, families, hobbies, and traditions, we know that our work is but one element of our identity. Our commitment to our families, lifestyles, and careers allows us the ability to relate to patients on a deeper level than often felt between healthcare provider and patient.

Throughout my clinical rotations and courses, I have been given the opportunity to watch Nurse practitioners navigate conflict resolution and problem solving while enriching their environments. Nurse Practitioners are often liaisons between nursing staff and physicians or other healthcare providers, bridging communication and offering solutions to conflicts. This element of leadership is an important aspect in providing safe and equitable healthcare in the context of collaborative interdisciplinary relationships.

This quality improvement project has given me the opportunity to assess for quality gaps, implement change, and evaluate the outcomes of effective change. As a leader, I have been able to implement nursing workflow changes to improve the providers ability to meet quality recommendations and ultimately prevent development of chronic disease in a vulnerable population. I feel that MSU has prepared me well for continual self-reflection and improvement of healthcare delivery as I have grown into a nursing leader.

Conclusion

While I have discussed four of the AANC's essentials at length, I believe MSU's DNP program has provided ample opportunity to learn and growth throughout each of the 10 domains. In my future practice as a Family Nurse Practitioner, I know I will reflect upon each element of

my education to provide the best individualized, evidence-based care I have. MSU has taught me the importance of continual process improvement, self-care and regulation, concern for the eradication of racism and bias in healthcare, and an assurance to the betterment of healthcare delivery.

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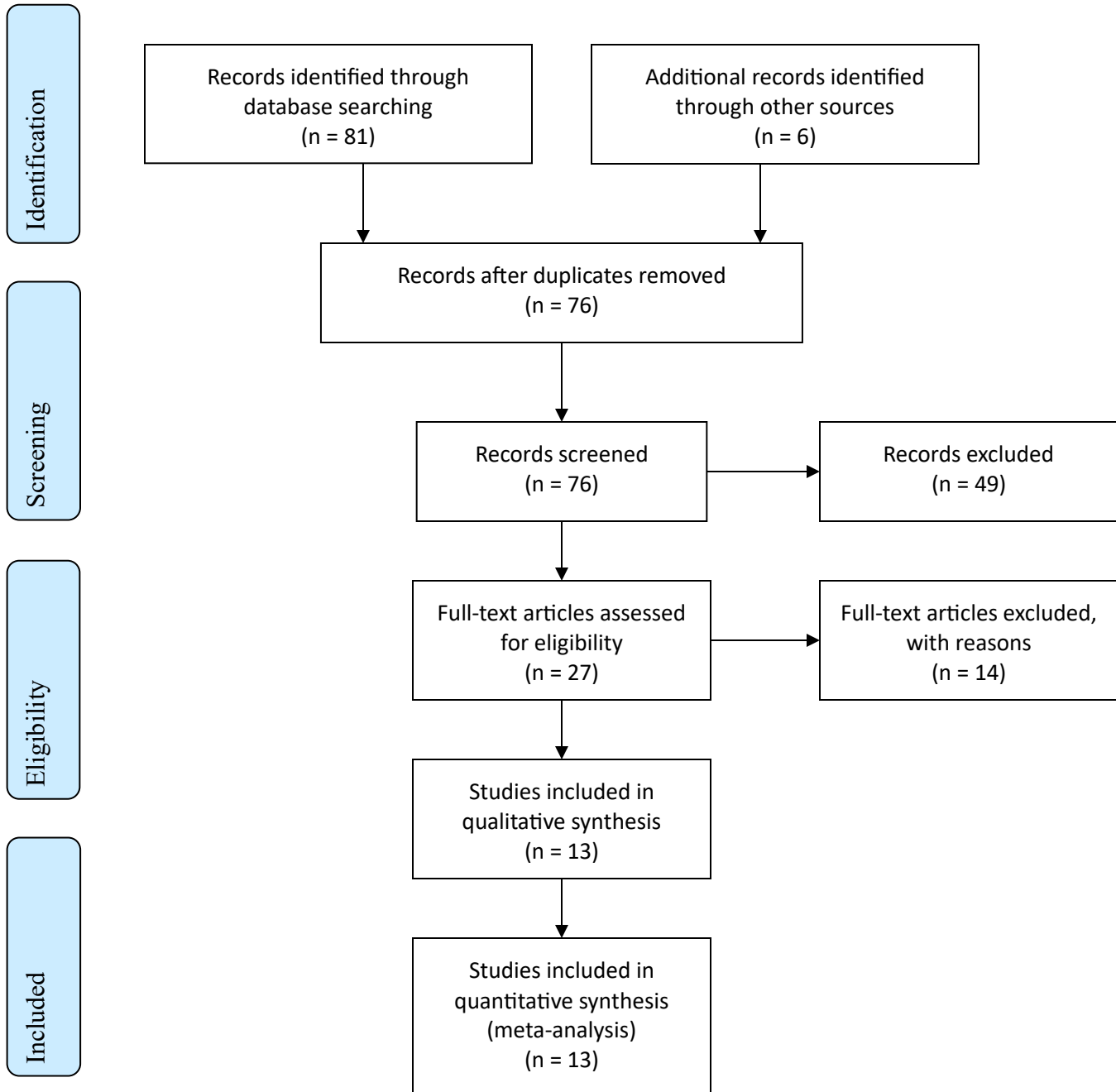
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APPENDICES

APPENDIX A

PRISMA

Appendix A: PRISMA



APPENDIX B

DATA TRACKING FORM

Appendix B: Data Tracking Form

Week 1:

# Patients correctly identified with GDM with smart phrase	# Patients who received correct 2-hour 75g gtt order	Total # patients with GDM seen in clinic for a postpartum visit

Week 2:

# Patients correctly identified with GDM with smart phrase	# Patients who received correct 2-hour 75g gtt order	Total # patients with GDM seen in clinic for a postpartum visit

Week 3:

# Patients correctly identified with GDM with smart phrase	# Patients who received correct 2-hour 75g gtt order	Total # patients with GDM seen in clinic for a postpartum visit

Week 4:

# Patients correctly identified with GDM with smart phrase	# Patients who received correct 2-hour 75g gtt order	Total # patients with GDM seen in clinic for a postpartum visit

Week 5:

# Patients correctly identified with GDM with smart phrase	# Patients who received correct 2-hour 75g gtt order	Total # patients with GDM seen in clinic for a postpartum visit

Week 6:

# Patients correctly identified with GDM with smart phrase	# Patients who received correct 2-hour 75g gtt order	Total # patients with GDM seen in clinic for a postpartum visit

End of implementation period:

Total # of patients correctly identified with GDM with smart phrase	Total # of patients who received correct 2-hour 75g gtt order	Total # of patients with GDM seen in clinic for a postpartum visit

APPENDIX C

FISHBONE DIAGRAM

Appendix C: Fishbone Diagram

