A Quality Improvement Initiative to Enhance Timeliness and Consistency in Gestational Diabetes Mellitus Management

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Abstract

Gestational diabetes mellitus (GDM) requires prompt intervention to ensure optimal maternal and neonatal outcomes, yet clinical workflows often lack the consistency needed for timely care. This quality improvement project aimed to standardize the diagnostic follow-up process at an urban collaborative practice to improve patient access to evidence-based best practices. Over an 11-week period (n=13), the implementation of a standardized clinical bundle featuring bilingual EHR SmartPhrases resulted in 69% utilization, exceeding the project goal. Additionally, results suggest the use of these structured EHR tools led to a substantial improvement in Medical Nutrition Therapy (MNT) scheduling from a pre-intervention 16% baseline to a post-intervention 30% proportion.

Problem Description

Gestational diabetes mellitus (GDM) presents a complex clinical challenge that extends beyond glycemic control. Effective care requires timely screening, interdisciplinary collaboration, and consistent patient engagement throughout pregnancy (Aldossery et al., 2024). However, the inherent complexity of GDM workflows often leads to miscommunication, fragmentation, and variation in care delivery (Mobin et al., 2024). These breakdowns in the system and in the workflow can disproportionately affect populations already at risk for poor health outcomes, exacerbating disparities and leading to suboptimal glycemic control.

Uncontrolled GDM is associated with a wide range of adverse maternal and neonatal outcomes, including hypertensive disorders, macrosomia, birth trauma, and long-term metabolic complications (Simmons et al., 2018; Metzger et al., 2008). However, the impact of uncontrolled GDM is not limited to physical health. Patients frequently experience diabetic distress, a psychological burden marked by anxiety, guilt, and frustration (Benton, 2024). This distress is

often compounded by feelings of stigma, isolation, and disconnection from their healthcare providers or their pregnancy (Sun et al., 2023).

Variation in individual provider practices further complicates care, as inconsistencies in diagnosis, treatment thresholds, and follow-up protocols can create confusion and mistrust in the healthcare system. Without a unified, evidence-based and patient-centered approach, opportunities for timely intervention may be missed, and those most in need of support may be unintentionally left behind. Addressing these systemic shortcomings is essential to improve clinical outcomes and foster more equitable, compassionate, and coordinated models of maternal care.

This challenge is widespread among maternity care providers across the United States and is similarly persistent within a collaborative practice consisting of midwives and physicians at an urban clinic in the Pacific Northwest. There are variations in the information provided to patients at time of diagnosis, differences in timing of appropriate referrals, and patient difficulty scheduling appointments with the appropriate care teams. As a result, a significant number of patients diagnosed with gestational diabetes mellitus are not adequately educated or monitored, leading to poorly managed or uncontrolled GDM.

Available Knowledge

Gestational diabetes mellitus (GDM) is a common pregnancy complication, affecting approximately 6–9% of pregnancies in the United States (American Diabetes Association [ADA], 2023) and 7.8% (Oregon Health Authority, 2014) in the state of Oregon. Left untreated, GDM poses substantial risks to maternal and neonatal health, including preeclampsia, cesarean delivery, macrosomia, neonatal hypoglycemia, and increased long-term risk of obesity and type 2 diabetes for both the birthing person and child (Metzger et al., 2008; Simmons et al., 2018).

However, with adequate management by both the patient and provider, pregnant individuals can mitigate the risks associated with GDM.

Current Guidelines and Best Practices

According to the American Diabetes Association (ADA) and the American College of Obstetricians and Gynecologists (ACOG), universal screening for GDM is recommended between 24 and 28 weeks of gestation using a one- or two-step glucose tolerance test (ADA, 2023; ACOG, 2018). Upon diagnosis, first-line treatment involves medical nutrition therapy (MNT), self-monitoring of blood glucose, and structured lifestyle interventions including individualized dietary guidance and physical activity plans. In up to 85% of cases, these non-pharmacologic interventions are effective in achieving glycemic control (Kapur et al., 2021). Pharmacologic treatment, typically using insulin or metformin, is reserved for cases where lifestyle changes alone are insufficient (Caissutti et al., 2018). Additionally, best practice calls for postpartum follow-up in the form of a glucose tolerance test at the 6-week mark or a hemoglobin A1c 12 weeks postpartum to identify persistent diabetes or pre-diabetes (Strelow et al., 2024).

Structured care pathways that begin with timely screening and include prompt referral for diabetes education, nutrition counseling, and glucose monitoring have been shown to improve glycemic control and reduce adverse outcomes (Davidson et al., 2021). In intervening soon after diagnosis, there is greater opportunity for the success of MNT and other lifestyle interventions of beneficially impacting outcomes.

Barriers to Effective Treatment: Patient Perspective

Despite these clear guidelines, numerous patient-level barriers hinder effective management. Patients with GDM often experience psychological distress, including anxiety,

guilt, and fear related to pregnancy complications or stigma around a diabetes diagnosis (Benton et al., 2023). Language barriers, health literacy limitations, socioeconomic constraints, and difficulty scheduling or long clinic wait times can all reduce adherence to treatment plans (Martis et al., 2018). Ethnic minorities including Black, Indigenous, Hispanic, and Asian individuals face disproportionately high rates of GDM and lower access to culturally responsive care, contributing to disparities in both outcomes and patient experience (Tzotzis et al., 2023). Postpartum follow-up is another area in which many patients face barriers, leading to delay in diagnosing persistent diabetes or pre-diabetes. Many patients are unaware of the need for continued monitoring after delivery, and competing demands in the postpartum period, including childcare, work responsibilities, and postpartum depression, further contribute to low screening rates (Khalifeh et al., 2021; Domingo et al., 2022).

Barriers to Effective Treatment: Provider Perspective

From a provider standpoint, inconsistent adherence to screening protocols, variation in treatment thresholds, and fragmented communication between interdisciplinary team members can disrupt continuity of care (Mobin et al., 2024). In collaborative practices such as those involving midwives and physicians, role ambiguity or lack of standardized protocols may lead to delays in diagnosis, missed referrals for education, or inconsistent pharmacologic initiation (Mobin et al., 2024). Time constraints and limited access to diabetic education resources further hinder comprehensive care delivery (Bose-Brill et al., 2019).

Benefits of a Standardized Approach

To address these challenges, standardized, multidisciplinary care pathways have emerged as a best practice. Evidence shows that embedding clinical algorithms into electronic health records (EHRs), automating referrals to nutrition and diabetes education at the time of diagnosis,

and integrating lab orders into discharge planning can reduce provider-level variation and improve outcomes (Strelow et al., 2024; Nielsen et al., 2023). EHR alerts and automatic scheduling of postpartum screening have been associated with significantly increased follow-up testing rates, enabling earlier detection of persistent hyperglycemia or type 2 diabetes (Domingo et al., 2022; Khalifeh et al., 2021).

Furthermore, incorporating culturally tailored education, interpreter services, and mental health screening into GDM care can improve patient engagement, reduce distress, and promote equitable outcomes (Mobin et al., 2024; Sun et al., 2023). A standardized, patient-centered approach that anticipates and addresses both clinical and psychosocial needs is essential for ensuring timely intervention, continuity of care, and improved long-term health for patients with GDM.

Rationale

This quality improvement (QI) initiative is grounded in evidence-based guidelines on the management of GDM, as well as regional and national prevalence data that underscore the vitalness of effective, patient centered care delivery. Internal assessments identified specific organizational gaps in quality, particularly in relation to interdisciplinary communication and workflow inefficiencies.

The project was conceptually framed using the Donabedian's model of healthcare quality (2005), which evaluates care through three interconnected domains: structure, the setting of care delivery; process, the method of communication between patients and providers; and outcomes, the impact on patients and populations. This model is especially relevant to this initiative given its focus on communication and coordination across disciplines – an essential component in providing quality GDM management. To evaluate the project's effectiveness, the Institute for

Healthcare Improvement's (IHI) Plan-Do-Study-Act (PDSA) Worksheet was employed. The PDSA cycle is one of the IHI's QI essentials, and is specifically designed to assist healthcare teams through the "methodology of learning" (Institute for Healthcare Improvement, 2017). This structed yet flexible framework allows for continuous evaluation and refinement of interventions to support data-driven decision-making in healthcare settings.

Demographic Context

Washington County's population is comprised of 39% minorities, and 25% of the population is Spanish speaking compared to 27.2% minorities and 14.3% Spanish speaking within the state of Oregon (United States Census Bureau, n.d.). While the state and national averages of GDM are 7.6% and 9.3% respectively, Washington County's prevalence is 13.9% (Oregon Health Authority (OHA), 2017; Washington County Health and Human Services, 2025).

According to the Centers for Disease Control and Prevention (CDC), in 2021, maternity care in the United States was primarily covered by either private insurance such as that through an employer (52.7%) and Medicaid (41.0%) (Valenzuela & JK, 2023). In 2023, 44.5% of births in Oregon, were covered by Medicaid, and 51.4% were covered by private insurance (KFF, 2025). Within this practice, 40.18% of pregnant individuals are covered by Medicaid, and 54.58% are privately insured.

Practice Context

This study took place at an interdisciplinary outpatient collaborative practice in Washington County, Oregon. The site is affiliated with a large academic center, and is comprised of six certified nurse-midwives and three obstetrician-gynecologists (OBGYNs). Additional team members include certified medical assistants, registered nurses (RN), and a practice manager.

Other team members in the GDM workflow who are not located on-site include a registered dietician and certified diabetes educator. Maternal fetal medicine physicians also play a role in co-management when it is determined patients require a higher level of care or need insulin therapy. Communication between staff occurs primarily via monthly meetings in which patient cases are discussed, while coordination of interdisciplinary care and logging of interactions occurs via EHR EPIC encounters and notes.

The site schedules fast-paced prenatal appointments in 20-minute increments, and patients are able to schedule with any provider. The practice averages around 31 deliveries per month, approximately 17% of whom are Spanish speaking. From January through April 2025, the clinic oversaw 68 patients with GDM, 21% of whom were Spanish speaking.

The practice's current workflow is riddled with inconsistencies. A major issue includes gaining access to the equipment required to appropriately manage diabetes. Differences in insurance payer types, difficulty in ordering supplies through a mail-order company, and a lack of follow-up results in patients being unable to access their glucometer and blood glucose test strips. The practice has gone through several iterations in an attempt to address this disparity, the most recent of which went into effect in June of 2025. The practice has switched to a different medical supply company through which they contract and order equipment. The goal of this change is to increase access to testing supplies for patients, thus improving their ability to check their glucose levels and appropriately self-manage their care. While this has somewhat improved patients' ability to receive their DME, other issues remain as persistent problems.

Another gap patients faced was being told they may not schedule appointments until they have received their testing supplies and have begun tracking their blood glucose. While this is true for the diabetic educator – whose focus lies in teaching patients to use their glucometer and

interpret results – the nutritionist does not require patients to have supplies, as their focus is on managing diabetes through diet and exercise. That distinction, unfortunately, was not made clear. Patients therefore weren't getting scheduled with either office, resulting in a knowledge deficit as they were not receiving the appropriate education. Without access to the nutritionist, patients were not receiving their MNT or exercise recommendations, preventing them from accessing evidence-based first-line treatment for GDM, and further impeding their ability to effectively manage their diagnosis.

Interventions

There was a recent overhaul of the process for ordering, managing, and treating GDM in the clinic, resulting in a lack of consistency between providers and a potentially detrimental impact on patients. To address the identified workflow inefficiencies and promote standardization of care for individuals diagnosed with GDM, a bundle was implemented. Bundles are a structured, evidence-based method of improving processes of care and patient outcomes that tie together interventions to standardize an approach and apply it consistently to patient care (Begum et al., 2023). This intervention – guided by best-practice recommendations and guidelines –consisted of both provider and patient facing components, and was available in both English and Spanish.

Standardized Workflow and use of the Problem List

A new clinical workflow was implemented for the initial management of GDM to ensure consistent adherence to best practices. As part of this intervention, key initial steps were documented in a standardized format within the "Overview" section of the patient's GDM Problem List. This included adding the patient to the clinic's GDM list, placing an urgent referral for Medical Nutrition Therapy (MNT), and ordering Diabetes Management Education (DME).

This centralized documentation included checkboxes to indicate task completion, allowing providers to quickly verify that all necessary steps have been taken. By streamlining and standardizing this process, the intervention aimed to reduce delays in referrals and access to DME, thereby enhancing patients' ability to initiate timely self-management of their condition.

Patient Communication and Documentation

Patient understanding and consistency of education delivery is another concern that was be addressed through this intervention. The development of a new Epic SmartPhrases in both English (.DNPGDMinitial) and Spanish (.DNPGDMinitialSp) were designed to standardize initial communication following a diagnosis of GDM. The education took place via MyChart in Epic, and was attached to abnormal test results. For patients without access to MyChart or who have not viewed their results and message within three days, a phone call was made by a staff member to verbally convey their diagnosis and next steps, as outlined in the SmartPhrase. This documentation tool provided consistent language when informing patients of a GDM diagnosis, identified relevant team members involved and their respective contact information, and directed patients to the appropriate next steps in their care plan.

Specific Aims

The global aim of this QI project was to improve organizational response to workflows to ensure patients with a diagnosis of GDM receive best practices and evidence-based care. Specific goals for the project were as follows:

1. Within 10 weeks of the project's implementation, 60% of charts with an abnormal 2- or 3-hour GTT lab result will show the *.DNPGDMinitial* or *.DNPGDMinitialSp* SmartPhrase within 3 days of abnormal test result.

2. Within 10 weeks of the project's implementation, 60% of charts will show a MNT appointment scheduled within 7 days of diagnosis.

Study of the Intervention

The Plan-Do-Study-Act (PDSA) cycle was used to continuously evaluate and refine the intervention (Institute for Healthcare Improvement, 2017). The project consisted of 3 cycles. At the end of each cycle, an email requesting feedback was sent to applicable stakeholders, including providers and RNs.

PDSA Cycle 1: Launch and Initial Feedback

The project was implemented and a voice-over PowerPoint was sent to the midwives and physicians to introduce the new workflow and clarify project expectations, process for submitting feedback, and provider roles. Once the intervention launched and providers began adopting and using the SmartPhrase and documenting in the Problem List, progress was tracked and documented in a table according to proportion of patients who achieved the outcome. Over the first four weeks, the project lead collected data on SmartPhrase usage and Problem List documentation. An email with a feedback form was sent at the end of the cycle, including updates and results from the initial launch. Based on feedback received, minor adjustments were made. The QI leader continuously met with the team to identify and address any concerns. Any changes were communicated to the staff prior to the start of the next cycle.

PDSA Cycle 2: Measuring for Improvement

Any issues identified were addressed and updates were implemented in the second cycle. Weekly data was reviewed by the team lead and discussed with the QI team. Feedback inquiries were sent bi-weekly and reviewed by the QI team upon receipt. Weekly data for the next four weeks was collected, analyzed, and used to evaluate the effectiveness of the intervention and

measure the performance against the specific aims. Based on the weekly analysis and submitted feedback, the QI team discussed findings and made data-driven decisions to ensure goals were being met.

PDSA Cycle 3: Final Analysis and Post-Intervention Planning

Following the 11-week intervention period, the QI-team conducted a final analysis of the constructed data tables. Feedback received at the end of the cycle was compiled to assess qualitative data. The team studied the final quantitative results to determine whether the intervention ultimately met the project's specific aims. The qualitative feedback was used to understand contributing factors related to the project's success or failure. A summary of the final outcomes, learning points, and recommendations for future PDSA cycles was compiled, and the workflow was adopted.

Outcome Measures and Data Collection

Over an 11-week period from October 2025 to December 2025, patients with an active pregnancy episode and a diagnosis of GDM in their problem list were identified and reviewed. Each week, newly diagnosed patients were assessed for the amount of time elapsed between diagnosis, documentation using the SmartPhrase, and MNT referral placement. The percentage of patients meeting each outcome was calculated relative to the number of patients newly diagnosed with GDM during the period of intervention. These proportions were used to evaluate the intervention's effectiveness, and categorized according to whether or not the 60% threshold was achieved each week.

Analysis

The project data was measured from October 2025-December 2025, with weekly quantitative data collected. The percentage of patients receiving an MNT referral within the first

7 days and percentage of patients with receipt of the SmartPhrase within 3 days following their diagnosis of GDM was reviewed weekly by the QI team as a measure of performance. Each week, the final data set was reviewed and compared to the original specific aims to establish whether there was successful uptake and improved standardization as a result of the new workflow.

Ethical Considerations

This project was submitted to the Oregon Health & Science University Institutional Review Board (IRB) for assessment and insurance of its ethical nature. Chart review was limited to the following sections in the EHR: Problem List, Test Results, and Encounters. Minimal risk was anticipated to patients, as no health information or PHI was collected, stored, or shared. All chart review was collected by the clinic EHR team, and no one outside of the QI project had access to protected data.

Results

Baseline data collected in the month prior to the bundle implementation yielded an average of 1 out of the 6 (16%) patients who were diagnosed with GDM received MNT within 7 days of their diagnosis. Over the course of the eleven-week intervention, thirteen patients were diagnosed with gestational diabetes. In total, nine (69%) received the SmartPhrase intervention, surpassing the project goal of 60%. Conversely, only four (31%) of the total cohort scheduled MNT within the 7-day timeframe, falling short of the 60% empowerment goal. Of note, all four patients who achieved the MNT outcome were in the SmartPhrase group.

SmartPhrase and Workflow Refinement

The intervention underwent three PDSA cycles to optimize patient education and outreach workflow, outlined in Appendix 4. During the initial cycle, provider feedback indicated

that the first iteration of the SmartPhrase lacked sufficient resources for patient self-management, and recommended the addition of websites and mobile health apps to direct individuals towards GDM-specific information and tools. In response, the SmartPhrase was expanded to include resources for diet and glucose tracking, along with links to reliable educational websites. While these were added to both the English and Spanish versions of the SmartPhrase, not all resources were available in all languages. Additionally, there was a timing delay following feedback receipt and onset of change, as all wording adaptations were sent to the clinic's medical translation services to be translated to Spanish and allow for accurate phrasing.

Following the second cycle, informal and solicited feedback revealed two key gaps. Several patients indicated they were not actively checking their MyChart messages and were unaware these platforms were utilized to communicate important health information. Additionally, despite outreach efforts and reminders, SmartPhrase utilization was inconsistent across different providers. While some indicated their appreciation of the SmartPhrase and acknowledged its ease of use, others reported difficulties with the project workflow. Feedback from providers demonstrated a timing deficit rather than a knowledge one. Although stakeholders were aware of the project, they were often responding to results while on-call at the hospital or during their clinic workday, meaning that messages were often not sent outside of those shifts. Additionally, when pressed for time, providers defaulted to their habitual follow-up messages, rather than taking the time to remember or look up the SmartPhrase.

To address these disparities, the workflow was modified in the third cycle by shifting the responsibility for SmartPhrase delivery from providers to nursing staff. This refined protocol integrated a nursing phone call to provide immediate diagnosis notification, followed by the

SmartPhrase delivered via a MyChart message. This transition to a nurse-led process resulted in 100% delivery rate of the intervention during the third PDSA cycle, as outlined in Table 1.

Table 1
Proportion of patients diagnosed with GDM who received their MNT within 7 days

	Week #	GDM diagnoses (n)	MNT ≤7 days (x)	Proportion (p = x/n)	Met 60% goal yes/no
PDSA 1	1	2	1	50%	no
	2	1	0	0	no
	3	2	0	0	no
	4	N/A no new diagnoses			
PDSA 2	5	1	0	0	no
	6	N/A no new diagnoses			
	7	2	0	0	no
	8	3	1	33%	no
PDSA 3	9	1	1	100%	yes
	10	N/A no new diagnoses			
	11	1	1	100%	yes
Total		13	4	30%	no

Timely Receipt of Medical Nutrition Therapy

The project design was geared towards improving the provider workflow, with a secondary aim of improving patient access to MNT. Cycles 1 and 2 yielded low 7-day appointment rates of 20% (1/5) and 16% (1/6), respectively. Additionally, one patient in the second cycle failed to receive any referral for MNT, and two patients received incorrect referrals, preventing them from getting an appointment. An additional patient was originally scheduled within seven days, but rescheduled to a later appointment for personal reasons and was not counted in the successful proportion. Providers who referred patients incorrectly were contacted on an individual basis and were notified of the error, but the process measures did not allow for further follow-up as patients subsequently fell outside of the intervention's scope. The third

PDSA cycle fared better, with a 100% appointment rate (2/2). Results surrounding appropriate scheduling of MNT can be viewed in Table 2.

Incidentally, many patients who did not receive any MNT were found to have closed referrals following an attempt to reach them by the Nutrition Therapy's AI call center. Documented notes on the referral stated the automated system would attempt to call, but did not leave a voicemail. Following two outreach attempts, referrals were closed, and a letter was mailed to the address on file to inform patients they needed to call to schedule an appointment.

Table 2

Proportion of patients who received news of their GDM diagnosis via the SmartPhrase within 7 days

	Week #	GDM diagnoses (n)	SmartPhrase ≤7 days (x)	Proportion (p = x/n)	Met goal yes/no
PDSA 1	1	2	2	100%	yes
	2	1	1	100%	yes
	3	2	0	0	no
	4	N/A no new diagnoses			
PDSA 2	5	1	0	0	no
	6	N/A no new diagnoses			
	7	2	2	100%	yes
	8	3	2	66%	yes
PDSA 3	9	1	1	100%	yes
	10	N/A no new diagnoses			
	11	1	1	100%	yes
Total		13	9	69%	yes

Discussion

Summary

The implementation of the GDM bundle resulted in a notable, though inconsistent, improvement in the timely receipt of MNT. Although the project occurred over an eleven-week period, there were three weeks in which no new patients were diagnosed with GDM, preventing any data collection and resulting in eight weeks of recorded data. Over the observed period, 13

patients were diagnosed, and 69% received the standardized SmartPhrase documentation, surpassing the project's 60% utilization goal. Conversely, the project's goal of enabling 60% of patients to receive MNT within seven days was not fully realized, with only 30% of individuals successfully completing the outcome. However, the 30% proportion of success demonstrates an overall improvement from the pre-intervention average of 16%. Additionally, four of the eight weeks yielded a higher appointment rate within seven days compared to the baseline. While the anticipated outcome was not met, an improvement from baseline was observed.

Interpretation

The transition from a provider-led, electronic-only system to a nurse led multimodal strategy served as a successful driver for improved clinical outcomes, as demonstrated by the success rate observed in PDSA Cycle 3. This adaptation served to address three critical systemic failures. First, the introduction of an RN phone call directly mitigated the communication gap caused by patients not actively monitoring their EHR portals. In providing a verbal diagnosis notification, the nursing staff ensured patients were aware of their health status and the immediate next steps, bypassing previous delays that resulted in patients remaining uninformed until their next prenatal visit. Second, delegating responsibility within the nursing workflow effectively resolved the notification delay stemming from competing clinical responsibilities among providers. While providers intermittently defaulted to habitual follow-up methods due to the high-pressure demands of on-call or clinic shifts, the dedicated nursing protocol ensured consistent utilization of the SmartPhrase, thereby eliminating disparities in the delivery of standardized educational materials. Finally, this proactive outreach served to offset the difficulties created by the inefficient MNT scheduling process by ensuring patients were either expecting the call from Nutrition Therapy and would answer their phone, or initiate contact and

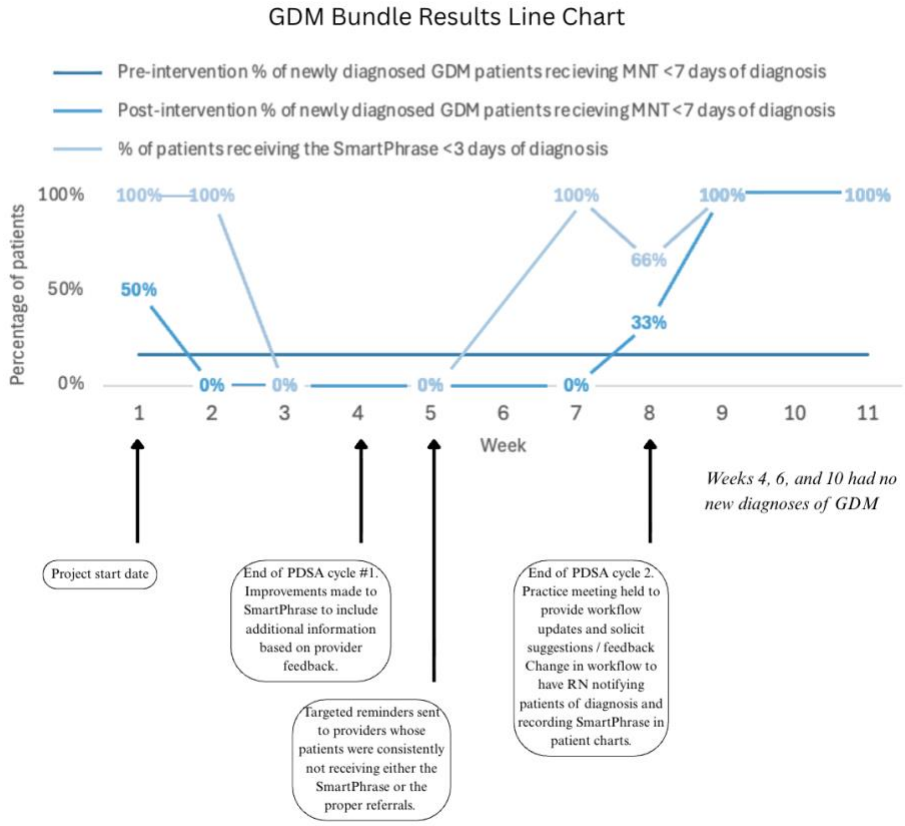
scheduling proactively. The nurse-led model resolved referral inaccuracies and notification lags that had previously hindered timely care, as evidenced by the significant shift from a 16% baseline scheduling rate to 100% success in the final PDSA cycle.

Another driver of change within the intervention was the transition from passive to targeted stakeholder engagement. Early in the intervention, broad email queries to the clinical team yielded low response rates or generalized feedback that lacked actionable detail. However, a shift towards targeted outreach to specific team members in PDSA Cycle 2, such as those with low engagement regarding observed barriers to SmartPhrase utilization, yielded insights general communications failed to offer. Additionally, specific communication with individuals who had previously offered insight was solicited on a more frequent basis, resulting in further actionable strategies. Prior to the onset of PDSA Cycle 3, the project was discussed in detail at a practice meeting involving all providers. This ensured project transparency and a centralized opportunity to communicate workflow updates, with the simultaneous benefit of directly soliciting comments, questions, and concerns related to the workflow. Overall, focusing on communication strategies that targeted individual stakeholders rather than nonspecific, generalized emails resulted in a drastic shift towards obtaining actionable and meaningful feedback.

Overall, there is a clear association between the SmartPhrase intervention and the successful scheduling of MNT, suggesting that the SmartPhrase acts as a critical driver for goal achievement. This is evidenced by Figure 1, which summarizes the relationship between the percentage of patients receiving MNT and those receiving the SmartPhrase. Peaks in MNT delivery occurring during weeks of 100% SmartPhrase usage, as well as weeks in which utilization of the SmartPhrase was 0%, and a matching rate of 0% MNT was observed. These results align with existing literature by Strelow et al (2024) and Nielsen et al., (2023), which

suggest that structured care pathways and EHR tools can reduce provider variation and improve patient engagement.

Figure 1



The primary cost of this initiative was the administrative time required for staff to adapt to the new workflow, representing a strategic trade-off in clinical time typically dedicated to other documentation tasks.

Strengths and Limitations

Several factors influenced the internal validity and broader application of this project. The small sample size (n=13) combined with the data gaps during weeks without a new GDM diagnosis impact the statistical power of the findings. Additionally, the project was specifically tailored to the site's existing staffing model and workflow. Because the intervention relied on

these local contexts, the workflow and outcomes cannot be directly translated to another clinical site without significant modification.

The project was also hindered by systemic and multidisciplinary contexts that served as an influence on observed outcomes compared to those anticipated. While provider buy-in was generally high, a lack of engagement from a small number of clinicians impacted the consistency of the dataset. Additionally, despite the success of 100% success rate of both outcomes in PDSA Cycle 3, the cycle's short duration hinders the ability to anticipate its long-term validity and sustainability. An incidental finding that greatly impacted the project's success was the external barrier of Nutrition Therapy department's automated call system, which failed to leave messages, closed referrals prematurely, and limited patient access to MNT.

Strengths of the workflow included highly motivated staff and strong buy-in from the clinic manager, medical assistants, RNs, midwives, and physicians, resulting in an overall successful uptake and the integration of the workflow into permanent practice. Additionally, the intervention was strongly informed by evidence-based care, and the standardization of the workflow increased patient access to best practices in initial GDM management.

Future Recommendations

In order for MNT timing to improve further, process enhancements must address systemic hurdles across departmental silos. Within the clinic workflow, possible next steps include implementing a standardized follow-up flag that prompts nursing staff to identify whether patients have confirmed their MNT appointment and perform a secondary outreach to individuals that have not yet done so. This internal safeguard would prevent patients from falling through the gaps, and address possible systemic barriers that hinder patients from self-scheduling. The workflow may additionally benefit from collaborative engagement with the

Nutrition Therapy department to evaluate and refine current referral outreach practices. Current practices include strategies that do not reliably notify patients and result in early referral closure, impeding access to indicated nutrition services. Revising these processes through cross-departmental collaboration can in turn optimize referral outreach processes and ensure alignment with evidence-based care.

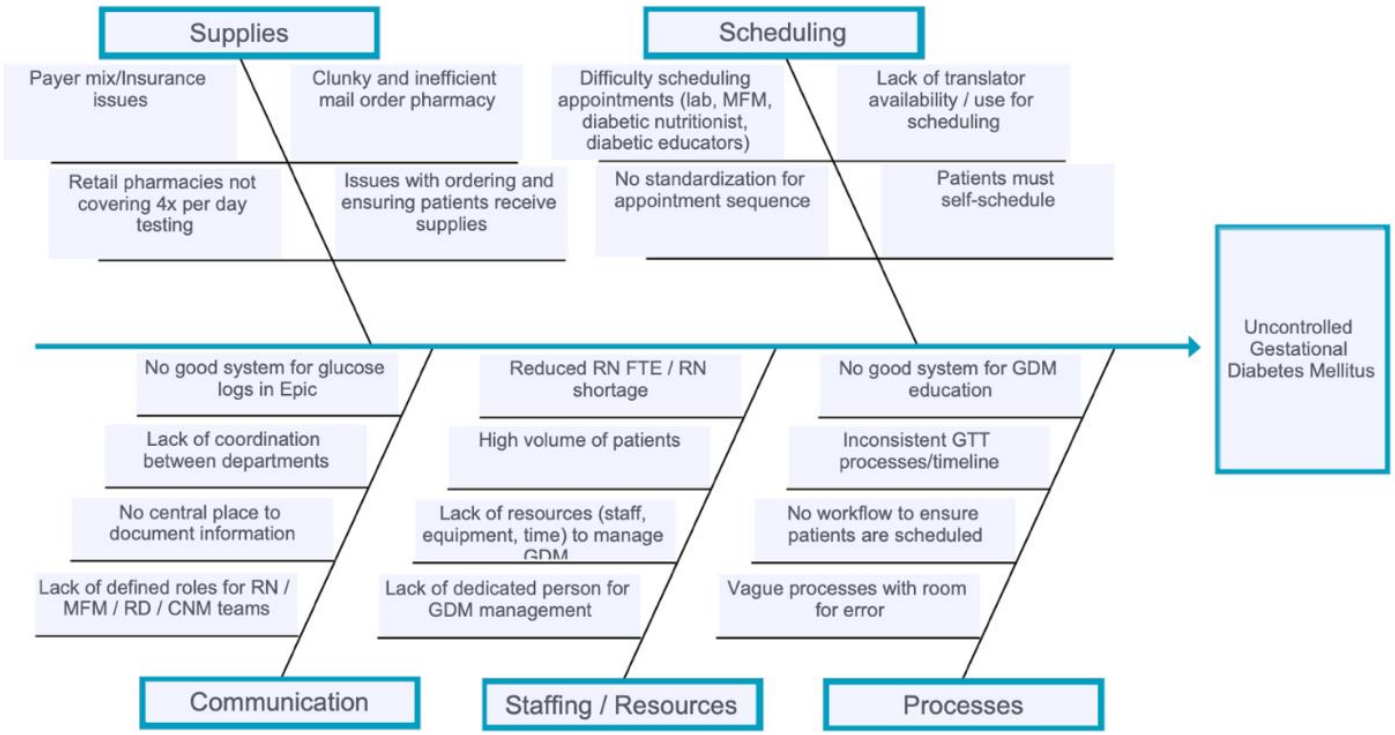
Another recommendation to enhance the longevity of the intervention is to ensure its sustainability beyond individual team members. Staff turnover has historically posed a challenge to the consistent implementation of a GDM workflow at this clinic site, and it is likely to impede future improvement cycles if unaddressed. To mitigate this risk, the establishment of a dedicated quality improvement team is recommended. This team should include key stakeholder representatives, such as physicians, midwives, nurses, medical assistants, and the clinic supervisor. Such a structure would enable regular, ongoing meetings to evaluate outcomes, identify barriers, and implement necessary adjustments. Furthermore, representation from each professional group would promote continued staff engagement with the intervention and ensure that, despite personnel changes, there are team members operating within their respective scopes of practice to support sustained improvements in GDM care.

Conclusion

This initiative demonstrates that structured EHR tools can effectively reduce care variation and bridge communication gaps following a GDM diagnosis, as evidenced by a 69% SmartPhrase utilization and a subsequent near-doubling of the MNT scheduling baseline from 16% to 30%. These findings align with established evidence that structured care pathways can reduce provider-level variation and improve patient engagement.

The project's primary utility lies in its ability to standardize the process for care for patients with a new diagnosis for GDM and maximize patient access to best practices. The workflow was adopted into clinical practice utilizing the adaptations from PDSA Cycle 3. The intervention's sustainability appears to be tied to nurse-led workflows, which resolve delays from competing responsibilities seen in provider-only iterations. While the intervention itself is hyperspecific to the clinic for which it was developed and cannot be directly translated to another setting, the concepts of standardized patient communication, use of delegation protocols that fall within the scope of staff licensure, and recognition of the patient as a key driver in their own health can all be relevant factors applicable to a variety of contexts. The management of gestational diabetes is multifactorial, and practice workflows must overcome these influences in order to provide effective evidence-based, patient-centered care.

Appendix



Appendix 1: Fishbone Cause-And-Effect Diagram

.HMCGDMinitial

Hi @FNAME@,

We got your glucose test results back, and there was an abnormal value showing that you have gestational diabetes. This means your blood sugar is higher than normal during pregnancy.

Managing this condition includes checking your blood sugar, making healthy lifestyle changes, and working with a team of specialists. While you play an important role in managing the health of you and your baby, please know we are here to support you.

Here's what happens next:

- Start by calling [redacted] *as soon as possible* to set up a visit with a nutritionist. The nutritionist will talk with you about healthy foods and exercise. Often, this is enough to manage diabetes in pregnancy.
- We will order testing supplies so you can check your blood sugar at home.
- Once you have your testing supplies, please contact our diabetes educator at [redacted] to schedule an appointment and learn how to test your blood sugar.
- You will need to check your blood sugar 4 times a day: within 30 minutes of waking (fasting), and 1 hour after each meal (breakfast, lunch, and dinner). Please write these values down and be prepared to share them with your health team.
- We will check in with you every week to review your blood glucose levels.

Please reach out to your midwife or obstetrician with questions you have about this diagnosis or your care. We are here for you.

Take care,
@ME@

@SIGNATURE@

.HMCGDMSp

Hola @FNAME@:

Recibimos los resultados de su prueba de glucosa con un valor anormal que indica que tiene diabetes gestacional. Esto significa que su nivel de azúcar en la sangre es más alto de lo normal durante el embarazo.

El manejo de esta enfermedad incluye medir su nivel de azúcar en la sangre, hacer cambios saludables en su estilo de vida y trabajar con un equipo de especialistas. Aunque cumple una función importante en el manejo de su salud y la de su bebé, estamos aquí para apoyarla.

Esto es lo que haremos a continuación:

- Primero llame al [redacted] *antes posible* para programar una consulta con un/a nutricionista. El/la nutricionista le hablará sobre comida saludable y ejercicio. Con frecuencia esto es suficiente para controlar la diabetes durante el embarazo.
- Ordenaremos suministros de pruebas para que pueda medir su nivel de azúcar en la sangre en casa.
- Cuando tenga sus suministros de pruebas, comuníquese con nuestro/a educador/a de diabetes a[redacted]ara programar una cita y aprender a medir su nivel de azúcar en la sangre.
- Necesitará medir su nivel de azúcar en la sangre 4 veces al día: dentro de los 30 minutos después de despertarse (en ayunas) y 1 hora después de cada comida (desayuno, almuerzo y cena). Anote los niveles para después compartirlos con su equipo de salud.
- Estaremos en contacto con usted cada semana para revisar sus niveles de glucosa en la sangre.

Comuníquese con su partera u obstetra si tiene alguna pregunta sobre este diagnóstico o sobre su cuidado. Estamos aquí para usted.

Cuídese,
@ME@

@SIGNATURE@

Appendix 2: First Draft of SmartPhrase template for patient communication in both English and Spanish

Hi [Name],

Your glucose test shows you have gestational diabetes. This means your blood sugar is higher than normal during pregnancy. The good news is that you can keep yourself and your baby healthy by eating well, exercising, and checking your blood sugar. We are here to help you!

What to Do Next:

1. **See our Nutritionist**
   - **Call** [redacted] as soon as you can to make an appointment.
   - A nutritionist will talk with you about healthy foods and safe exercise. Many people can manage gestational diabetes this way.
2. **Get Supplies to Check Blood Sugar at Home**
   - We will order supplies for you. Depending on your insurance, they may be mailed to you or sent to your pharmacy.
   - A company may call to confirm your address. So please check your voicemails until you get your supplies.
3. **See our Diabetes Educator**
   - **Call** [redacted] to make an appointment.
   - They will show you how to check your blood sugar and answer your questions.

Now you're ready to Check Your Blood Sugar 4 Times Every Day

- Right after you wake up (before eating)
- 1 hour after breakfast
- 1 hour after lunch
- 1 hour after dinner

Tracking Your Numbers: It is important to record your blood glucose numbers for review with your provider weekly.

- You may write your numbers down on paper. OR
- You may use the free version of any of the apps below to track your blood sugar.
- App examples:
  i. Malama Health
  ii. GD Tracker
  iii. mySugr
  iv. Glucose Buddy
  v. One Drop

Weekly Check-Ins with your HMC Midwife/OB Team

- We will check in with you every week to see how your blood sugar is doing.
- We will use MyChart. Make sure your account is active and you log in to send updates.

Attached to this message is some additional information about gestational diabetes in pregnancy. We will review this diagnosis together at your follow-up visits.

If you have any questions, please reach out to your midwife or obstetrician.

We are here for you and want to help you have a healthy pregnancy!

Take care,

[Your Care Team]

Hola, [Name]:

Su prueba de glucosa muestra que tiene diabetes gestacional. Esto significa que su nivel de azúcar en la sangre es más alto de lo normal durante el embarazo. La buena noticia es que puede mantenerse saludable a usted y a su bebé si come bien, hace ejercicio y controla su nivel de azúcar en la sangre. ¡Estamos a su disposición!

Qué hacer a continuación:

1. **Consulte a nuestro/a nutricionista**
   - **Llame al** [redacted] lo antes posible para programar una cita.
   - Un/a nutricionista le hablará sobre comida saludable y ejercicio seguro. Muchas personas pueden manejar la diabetes gestacional de esta manera.
2. **Obtenga los suministros para controlar el nivel de azúcar en la sangre en casa**
   - Pediremos los suministros por usted. Según su seguro, pueden enviárselos por correo o enviarlos a su farmacia.
   - Es posible que una empresa llame para confirmar su dirección. Así que controle sus mensajes de voz hasta que reciba los suministros.
3. **Consulte a nuestro/a educador/a de diabetes**
   - **Llame al** [redacted] para programar una cita.
   - Le mostrarán cómo controlar su nivel de azúcar en la sangre y responderán sus preguntas.

Ahora está lista para controlar su nivel de azúcar en la sangre 4 veces cada día

- Justo después de despertarse (antes de comer)
- 1 hora después del desayuno
- 1 hora después del almuerzo
- 1 hora después de la cena

Cómo hacer un seguimiento de sus cifras: Es importante que registre las cifras de su nivel de glucosa en sangre para revisarlas con su médico/a.

- Puede anotar las cifras en un papel; O
- Puede usar la versión gratuita de cualquiera de las aplicaciones a continuación para hacer un seguimiento del nivel de azúcar en la sangre.
- Ejemplos de aplicaciones:
  i. Malama Health
  ii. GD Tracker
  iii. mySugr
  iv. Glucose Buddy
  v. One Drop

Controles semanales con su equipo de parteras/obstetras de HMC

- Estaremos en contacto con usted cada semana para ver cómo está su nivel de azúcar en la sangre.
- Usaremos MyChart. Asegúrese de que su cuenta esté activa y de iniciar sesión para enviar actualizaciones.

Adjunto a este mensaje encontrará información adicional sobre la diabetes gestacional durante el embarazo. Revisaremos este diagnóstico juntos en sus consultas de seguimiento.

Si tiene preguntas, comuníquese con su partera u obstetra.

Estamos aquí para usted y queremos ayudarla a que tenga un embarazo saludable.

Cuídese,

[Your Care Team]

Appendix 3: Final iteration of SmartPhrase template in both English and Spanish

PDSA Cycle 1: 9/29/2025-10/26/2025

Adapt: Improvements made to SmartPhrase to include additional information based on provider feedback.

PDSA Cycle 2: 10/27/2025-11/23/2025
11/18: Practice all-provider meeting held to provide workflow updates and solicit suggestions / feedback

Adapt: Targeted reminders sent to providers whose patients were consistently not recieving either the SmartPhrase or the proper referrals, rather than all-provider emails.
Updates given and feedback solicited at all-provider meeting rather than via email.

PDSA Cycle 3: 11/24/2025-12/16/2025

Adapt: Change in workflow to have RN notifying patients of diagnosis and recording SmartPhrase in patient charts.
Adopt: ACOG handout added to SmartPhrase and sent to patients to provide additional information regarding their diagnosis and prognosis.

Appendix 4: Summary of PDSA Step 4 (Act and Adopt, Adapt and Abandon Decisions)

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