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On the Same Page: A Novel Interprofessional Model of Patient-Centered Perinatal Consultation Visits

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Abstract

OBJECTIVE—To plan and implement an interprofessional collaborative care clinic for women in midwifery care needing a consultation with a maternal-fetal medicine specialist.

DESIGN—A community-engaged design was used to develop a new model of collaborative perinatal consultation which was tested with 50 women. Participant perinatal outcomes and semi-structured interviews with 15 women (analyzed using qualitative descriptive analysis) and clinic providers were used to evaluate the model.

RESULT—Participant perinatal outcomes following a simultaneous consultation visit involving a nurse-midwife and maternal-fetal medicine specialist were similar to practice and hospital averages. Women's comments on their experience were positive and had the theme “on the same page,” with 6 sub-categories: clarity, communication, collaboration, planning, validation, and ‘above and beyond.’ Providers also were pleased with the model.

CONCLUSION—A simultaneous consultation involving the woman, a nurse-midwife, and a maternal-fetal medicine specialist improved communication and satisfaction among women and providers.

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Keywords

Midwifery; Interprofessional care; Health services accessibility; Perinatal care; Prenatal care; Antenatal care; Regionalized care

INTRODUCTION

In the United States (US), certified nurse-midwives (CNMs) provide perinatal care to a diversity of women, including those with risk factors for poor perinatal outcomes, consulting as needed with other members of the healthcare team.¹ Due to the increasing prevalence of maternal chronic conditions and greater use of fetal testing, more women are identified with risk factors for poor perinatal outcomes.² Consultation and collaboration allow women to receive the appropriate prenatal and intrapartum care based on their preferences and medical needs.³⁻⁵ While midwifery care is associated with excellent perinatal outcomes,⁶ women with medical conditions or abnormal test results may benefit from specialist input during their pregnancies. Midwives certified in the US by the American Midwifery Certification Board (AMCB), including CNMs and certified midwives (CMs), may practice in ambulatory settings without physicians, such as obstetricians (OBs) or maternal-fetal medicine (MFM) specialists, on-site. While consultation and collaboration among members of the interdisciplinary healthcare team are encouraged by the World Health Organization, the American College of Obstetricians and Gynecologists (ACOG), and the American College of Nurse-Midwives (ACNM),^{1, 5, 7, 8} the literature is limited on successful models.⁹⁻¹⁵

Collaboration is defined by an ACOG Task Force as “a process involving mutually beneficial active participation between autonomous individuals.” (p. 614).⁸ While ideally collaboration involves a member from each provider-type caring for the woman as well as the woman herself, sometimes active participation with all of the individuals does not occur in person or at the same time. The communication and participation of collaboration frequently occur through the electronic medical record, or may occur in person but not include all members of the healthcare team. For instance, the midwife and the physician may discuss the case, or the woman may meet with the physician without a midwife present.

While all healthcare providers should be competent in interprofessional communication and collaboration,^{5, 16} the pace and structure of healthcare can fragment communication. Current models of perinatal collaboration allow for comprehensive planning but increase the potential for communication errors, a leading cause of maternal morbidity and mortality.¹⁷ Since all types of providers are not able to simultaneously speak with the woman, there is a risk of errors or misunderstandings. In addition, asynchronous models of perinatal consultation may not allow the woman to be an equal partner in care planning, consistent with the Hallmarks of Midwifery¹ and the tenets of patient-centered care.¹⁸ Based on previous qualitative literature, women who receive fragmented care may feel disenfranchised and are more likely to decline care.¹⁹⁻²¹ While a disconnect between women's needs and the medical system may be more pronounced in certain locales, there has been a recent trend for sub-groups of women to opt out of traditional medical care. For instance, there has been a prolonged rise in out-of-hospital birth in the US, especially for women attempting vaginal

birth after cesarean, suggesting women across the country are opting out of traditional medical care, even when they have an elevated risk for complications.^{22, 23} Women declining recommended interventions occurs frequently enough that in June 2016, ACOG released a committee opinion on the topic calling for providers to use an interdisciplinary approach to inform women and change their expectations of perinatal care, while allowing them the autonomy to decline or accept medical interventions.²⁴ However, ACOG did not provide guidance on effective models as research is limited.²⁴ New models of collaboration are needed to ensure women are actively engaged in decision-making and receive the appropriate level of maternity care according to their medical and personal needs.

Spurred by patient and provider dissatisfaction with existing models of collaboration, we used a community-engaged approach to develop and implement a new model of collaboration between a low-risk midwifery practice and a group of MFMs. Using best practices from the literature, an existing interprofessional care model in England,²⁵ and interviews with local stakeholders, we developed a collaborative clinic where a nurse-midwife and a MFM specialist met simultaneously with women needing MFM consultation. The purpose of this manuscript is to describe the development, implementation, and outcomes of this novel format of care.

SETTING and USUAL CARE

The study took place in an urban area in the Southeast United States at an academic medical center employing a variety of maternity care providers including CNMs, generalist OBs, and MFM specialists. The nurse-midwifery service had been providing care to low and moderate-risk women for over a decade, collaborating with generalist OBs and MFM specialists when women needed higher-level services. The nurse-midwifery service provided outpatient care at an on-campus clinic within a mile of the hospital. Each woman receiving nurse-midwifery care with risk factors for poor perinatal outcomes had at least one prenatal consultation visit with an MFM specialist. (See Table 1 Inclusion criteria for a list of conditions requiring consultation.)

Generalist OBs and MFM specialists provided outpatient consultation services to the nurse-midwifery practice from a large medical office complex 4 miles from the hospital, 5 miles from the midwifery clinic. Following the consultation, the generalist OB or MFM specialist placed a comprehensive note in the woman's chart outlining the plan for future care. Depending on their medical needs, women would be transferred to the generalist OB or MFM service or return to the nurse-midwifery practice.

All women receiving outpatient care at these clinics gave birth in the academic medical center where at least one nurse-midwife, generalist OB, and MFM specialist were available continuously. Each practice provided direct care for women seen in their ambulatory care settings, and physician groups were available for consultation and collaboration for women receiving care in the nurse-midwifery practice who needed specialist care.

The midwifery and MFM groups had worked together over 10 years; however, communication and collaboration using this approach was sub-optimal. Women with risk

factors met with a generalist OB or MFM specialist at a different location than the midwifery practice, without a midwife present. The asynchronous nature of outpatient consultations made it difficult to construct patient-centered plans of care. Collaboration among the large teams of providers working in different locations was logistically challenging, especially since clinical guidelines changed frequently in response to evidence.

Adding another layer of complexity, women often declined standard care or were uneasy about recommendations for interventions. Women choosing nurse-midwifery care were more likely than women choosing physician care to decline recommendations for intervention. In some cases, the women were reluctant to accept specialist recommendations, even those targeted for their specific medical needs. For instance, women with low platelets declining IV access in labor, or women with risk factors for stillbirth declining continuous monitoring. The lack of trust of medical intervention became especially apparent in 2013 when there was a resurgence of vitamin K-deficiency bleeding in the greater metropolitan area as nearly 5% of women giving birth at the hospital declined routine vitamin K-prophylaxis for their infants; women in midwifery care were disproportionately represented in this group.²⁶ In some ways this metropolitan area was unique in women's desire to opt out of medical interventions. However, this was consistent with evidence from national trends^{23, 24, 27} New models were needed to build trust with women and the larger birthing community and facilitate uptake of evidence-based care.

In addition to communication issues between women and providers, improvements in inter-provider communication were also needed. MFM specialists did not have a clear understanding of the scope of this nurse-midwifery practice as clinical guidelines were updated frequently, and there was another nurse-midwifery group in the same hospital who practiced with different clinical practice guidelines. The specialists wanted to be considerate of women's desire for midwifery care, but were not certain what precluded care within this midwifery practice.

As a result of these complex factors, patient and provider satisfaction with the outpatient consultation process was low, and a new model of collaboration was needed to improve communication and quality care. In response to concerns, the primary author, a PhD-prepared nurse-midwife with training in qualitative methods, together with the director of the midwifery practice developed a new collaborative model based on a community-engaged approach, best practices in care, and a European clinic.²⁵ Institutional Review Board approval was obtained. Following approval, stakeholders were interviewed to adapt the European model to local needs.

DEVELOPING the COLLABORATIVE CONSULTATION MODEL

To ensure the needs of stakeholders were incorporated in the new model, key stakeholders were asked to participate in interviews with the primary author to determine the current and ideal states of the collaborative relationships. Four nurse-midwives, a nurse, and an MFM specialist participated in formal interviews. In order to incorporate women's feedback, the clinical practice director provided common and recent concerns from women who had MFM specialist consultations. All stakeholders agreed having a nurse-midwife and an MFM

specialist present for a consultation visit with the woman would be ideal as it would likely increase trust, decrease communication errors, and improve collaboration. Interview comments demonstrated broad agreement on the goals of consultation and the roles of the nurse-midwife and the MFM specialist within consultation visits.

Goal of Consultation with Maternal-Fetal Medicine Specialists

Stakeholders stated that the goal of the consultation visit with the MFM specialist was to create a plan or “blueprint,” for the woman's care and mentioned collaboration and planning as essential components of consultation visits. Nurse-midwives also mentioned the need for referral to the MFM service when women have medical conditions outside of the scope of the nurse-midwifery practice. The nurse-midwives provided examples of women requesting to return to midwifery care even though their medical conditions were outside the practice's clinical guidelines. Everyone agreed that it was difficult to create patient-centered plans of care solely through the electronic medical record and telephone conversations among providers.

Role of Each Provider Type within the Collaborative Visit

There was wide agreement on the preferred roles of nurse-midwives and MFM specialists within a simultaneous, collaborative visit. The MFM specialist was the “expert in obstetrical complexities,” who was able to provide “perspective and management advice” for women with risk factors for poor perinatal outcomes. Nurse-midwives were independent practitioners who worked within the larger perinatal network assisting low-risk women, collaborating frequently with other members of the healthcare team, including generalist OBs and MFM specialists.

Stakeholders had nuanced descriptions of the ideal role of the CNM at a simultaneous consultation visit with the MFM specialist and the CNM present with the woman. They mentioned that women who seek midwifery care often have plans for pregnancy and birth that affect their ability to adequately process the MFM specialist's recommendations. Terms used to describe the role of the CNM included “advocate” and “cultural broker” to bridge the woman's expectations for a natural birth with the potential need for intervention. Stakeholders stated that the CNM may inspire the woman's trust to allow her to overcome anxiety or negative perceptions of specialist care. Stakeholders felt the woman would view the CNMs as an advocate to assist with planning and reiterate key points at later visits. In addition, stakeholders mentioned that CNMs would implement the plan if the woman returned to the midwifery service.

Value of a Checklist for Consultation Visits

Stakeholders mentioned that with asynchronous visits, it was common for certain details of the plan to be forgotten. Midwives and the nurse-stakeholder expressed that they would like more detail on the effect of a woman's condition on postpartum and interconceptual care (e.g., whether the diagnosis influences her time of postpartum discharge, birth control, or optimal pregnancy spacing). A stakeholder suggested a checklist would facilitate comprehensive care, and a checklist was developed and refined using feedback from nurses, nurse-midwives, and MFM specialists. To ensure women's needs were incorporated in the

visit, several questions based on information from the Patient-Centered Outcomes Institute (PCORI) were placed at the beginning of the checklist to prompt practitioners. The checklist had four sections: antepartum, intrapartum, postpartum, and interconceptual care. Each section included a checkbox to select appropriate care. If the woman needed anything other than support for physiologic process, there was a space to include the reason for intervention. All providers approved the checklist prior to use, and no changes were made after study implementation.

THE INTERVENTION: A NEW COLLABORATIVE CLINIC FORMAT

The collaborative clinic model allowed women in midwifery care who needed a consultation to meet simultaneously with an MFM specialist and a CNM from their original practice of choice. Up to 5 collaborative visits were available each week at the MFM clinic. Only women needing an MFM consultation with the potential for later midwifery management were included in the study. Within this health system, there were already in place specialized clinics in place to care for women with diabetes, drug use, and life threatening abnormalities, therefore these conditions were not included in this study. Women with the high-risk conditions listed as exclusion criteria in Table 1 were only seen for a screening visit at the CNM-clinic as their conditions precluded midwifery care. Since these women did not have a relationship with the CNM group or were not able to wait for a collaborative visit, they were excluded from the study. IRB approval was obtained prior to implementation. If a woman met inclusion and exclusion criteria in Table 1, she was asked by a nurse-midwife or office nurse if she was interested in participating in a study of collaborative care. If a woman met inclusion criteria and was interested in participation, the primary author obtained informed consent. Due to the nature of the intervention, no blinding was attempted for the study.

Once enrolled, a woman had a high-level ultrasound at the MFM clinic (if indicated) immediately prior to the collaborative visit. The digital ultrasound images were immediately available for MFM specialist review. Following the ultrasound, the woman met with the CNM and MFM specialist simultaneously. The checklist was used to guide the visit and began with patient-centered questions. Following a discussion of the woman's concerns, the MFM specialist performed a complete history and a targeted physical exam. Lastly, the woman, CNM, and MFM specialist collaborated on a plan that met the woman's medical and personal needs. The goal was to provide a personalized plan for future care. The completed checklist was signed by the woman and both practitioners at the end of the visit and scanned into the electronic medical record for access by the woman and all care providers. The women in the study received only one collaborative visit to plan their care and future visits with the midwife or the MFM specialist were individual. Women in the study received the same number of visits with each provider type as women who received individual consultation visits.

IMPLEMENTATION and ASSESSMENT of the COLLABORATIVE CLINIC MODEL

Between November 17, 2014 and May 12, 2015, 50 women were enrolled in feasibility testing of this model and the model assessed primarily with qualitative measures. The

sample size of 50 women was chosen to provide enough data to assess the logistic feasibility of the model and provide an adequate sample for qualitative interviews and assessment of model safety.

All women who consented to research participation were seen simultaneously by a CNM and a MFM as described above. Following their collaborative care visits, a convenience sample of women who agreed to an interview at the time of consent were called and invited to complete telephone interviews with the primary author about their experiences. All women in collaborative care were contacted for an interview until saturation of findings was reached, consistent with sequential sampling. Participants had all met the interviewer during the research consent process, but had no other previous contact. Fifteen women completed interviews. A semi-structured interview guide (see online-only supplementary content) was used, and women received a \$15 gift card for their time. Participant interviews were conducted until saturation of findings was achieved. Stakeholders were interviewed again 5 months after implementation to discuss the collaborative model, including functioning and its effect on communication, collaboration, and patient care.

All interviews were transcribed verbatim, and analyzed using qualitative descriptive content analysis of manifest content as described by Elo and Kyngas²⁸ and Graneheim and Lundman.²⁹ Authors (blinded initials – authors 1,2,3,4) immersed themselves in the data, reading and re-reading transcripts, then independently coded the transcripts. The ATLAS-ti qualitative coding software was used to organize transcripts and codes. Interviews were analyzed in 3 meaning units: stakeholders prior to clinic development, participants following collaborative care, and stakeholders after establishment of the clinic. Following independent coding, the authors met on 4 occasions to review coding and iteratively define and refine codes and categorize them into categories. Categories were then collapsed and grouped into major themes. Consistent with our conceptual framework that acknowledged multiple pressures on perceptions and health outcomes,³⁰ a quote could be placed in multiple categories. However, an effort was made to ensure that quotes were in the category and theme that best reflected their meaning.

Perinatal outcomes were collected from participant charts following birth to assess safety and gather data to plan future trials. Since this was a feasibility study, no attempt was made to ensure statistical power. Instead, perinatal outcomes were compared with CNM practice, hospital, and national averages as benchmarks, but no formal analysis was obtained due to the low sample size.

RESULTS

Demographic Characteristics of Participants

Demographic characteristics of all participants (not just those completing interviews) are shown in Table 2. Women were asked to self-identify their race(s) and ethnicity using categories consistent with the US birth certificate. The overwhelming majority of participants identified as White, non-Hispanic, consistent with the practice demographic profile. While several women had a native language other than English, only 1 was not

fluent in English at the time of the visit; phone translation was used during this visit, consistent with health-system policy for rare languages.

Participants, on average, had been pregnant 2.3 times with a range of 1-6 pregnancies. Thirty-six percent of participants were pregnant for the first time, 28% were in their second pregnancy and 36% were within their third or higher pregnancy. The average parity was 0.86 with a range of 0-3. Forty-eight percent of participants were nulliparous, 30% had given birth once before, and 22% of participants had given birth 2 or more times.

Qualitative Results

Interviews with women following collaborative care were, on average, 9 minutes long with a range of 5 to 14 minutes. Interviews were conducted both antepartum (12 women) and postpartum (1 woman), though the interviews conducted within 2 weeks of the collaborative visit provided the greatest depth of description. Participant answers to the semi-structured interview questions can be categorized into 3 overarching themes: responses to questions on patient-centered care, experiences of the collaborative clinic, and suggestions for improvement.

Patient-centered care comments—Women responded positively to the questions about patient-centered care, stating that the practitioners spent time reviewing their medical needs and discussing their concerns and preferences for the pregnancy and birth process.

“They were extremely thorough in going over all my medical risks and going over the risks to my pregnancy and all the possible outcomes that could happen, good and bad.” (P287)

There was 1 aspect of patient-centered care participants felt was not discussed during the visit. Participants were asked, “Did the visit tell you what you could do to improve the outcomes that were most important to you?” Women responded that either this information was not well covered within the visit or pointed out with an emotional overtone that there was nothing they could do to affect the fetal outcome. For many of the women, there was little that could be done. For instance, no evidence-based strategies are available for women to increase platelets, change placental location, or correct minor fetal abnormalities. This question may not be applicable for all pregnant women as some aspects of obstetric practice involve only supportive care rather than behavior change.

Women's Experience of Collaborative Care: On the Same Page—The overarching theme of the women's comments was that collaborative care allowed the medical team, including them, to be “on the same page.” Four women used this exact term during the interviews, and many others had comments with the same underlying meaning. Comments about the clinic experience could be classified into 6 categories: clarity, communication, collaboration, planning, validation, and ‘above and beyond.’

Clarity: Participants expressed that the clinic was effective at clarifying what portion of their pregnancy was not typical and providing authoritative information about their prognosis and care. Women stated they had previously received or found different, or even

contradictory, information about their diagnoses, resulting in confusion or anxiety. The collaborative visit produced clear, personalized information.

Just an awareness of what was actually happening, and to understand what was happening, and what our options were, and what was the worst case scenario, what was probably going to happen as far as the doctor and midwife could tell. Just to understand the situation better and what could possibly happen. (P408)

Communication: Women appreciated that the visit brought providers from both practices together, streamlining the flow of information and reducing their burden to understand and convey results. Women mentioned that in previous experiences with specialist care prior to pregnancy, they had to describe the results of the consult to their primary care provider, increasing their stress. The women appreciated that since a provider from both groups was involved, critical content would be shared with both practices.

It (the visit) would have been a little bit scarier if the midwife hadn't been there. Then it was also good to know that everything that was happening at that visit was going to seamlessly go back to the midwife's office, because she was going to take it back there, and I didn't have to worry again about that information not being shared completely, or something in the transfer, something getting lost. It was so much information for me to keep up with. It was a ton of information. My head was just overloaded with stuff, but because she was there, I knew that I didn't have to worry about all that. She was going to handle communicating all of that to the midwives. (P408)

I think collaborative care is good. I think it's nice to not have to then go [back] to your nurse midwife and explain everything that you just talked about... It just feels like everybody's on the same page and I don't have to then translate.... I don't want to be the messenger. (P33)

Collaboration: Participants commented that they enjoyed seeing the collaboration between the providers. The women felt safer knowing additional help was readily available and were relieved to have met a specialist. Beyond simple knowledge of how complications would be handled, women were also pleased to see the dynamic nature of the collaboration and experience how the midwife advocated for their preferences as well as maternal-fetal safety.

It was just a really authentic collaborative, kind of organic collaborative relationship that they had, and I was present for that, so that was neat. I didn't have a problem with the fact that they were arriving at different conclusions at all, it was just watching that collaboration happen, and then the chart coming together to the final decision about what was best, so that was neat... I really thought that the whole visit went really well, and when my husband and I left, we felt a lot better about things. Now we know that there's a plan, and we feel like we can trust the people who are handling this. So...We felt a lot better about that. That was a big part of the visit. Just the reassurance that even if things don't go the way we want them to, that it'll be okay because we have kind of like a team in place. (P408)

I wanted to hear from, honestly, an OB perspective and a midwife's perspective, on what was happening. I know that in some respect, there's different philosophies of care and practice. It meant a lot to me that I had a midwife present to be an advocate in some ways during the conversation. (P320)

A Plan in Place: Women appreciated that throughout the visit they were able to engage with both practitioners to develop a comprehensive plan of care. The creation of a plan decreased women's anxiety and provided guidance on next steps and potential outcomes.

It felt like it was really thorough. It felt that they went over my whole history, and I felt like they were going to be monitoring my pregnancy really closely and that they had a solid plan for that, and so I think that having that plan in place is what made me feel probably best about it. (P12)

Most women stated that they were able to express their preferences for the practitioner or the location of care and have their needs incorporated into the final plan.

I really wanted to be able to stay with a midwife if possible, and so they gave me the option of doing that as long as my blood pressure doesn't get worse. So yeah, for now, I feel like I was heard on what I wanted for the pregnancy. (P287)

However, other women stated that the plan of care was based solely on the current recommendations for their or their fetuses' condition. These women did not seem displeased but expressed that the follow-up did not involve choices. (For instance, the assessment and treatment of a woman with a previous preterm birth is fairly scripted by expert guidelines.)

Women preferred the midwifery philosophy of care with specialist care available if needed. One woman stated her displeasure at "being kicked out of the midwives," and several women expressed similar feelings. Participants stated the consultation helped them see why specialist care was appropriate and facilitated letting go of previous birth expectations.

I really wanted things to be hands-off and for me to not have to have multiple interventions and ultrasounds and things like that, but I also knew I was in a high risk category and it's out of my control at that point...We talked a lot about how I wanted it to be, what I wanted my pregnancy to be like and I how I felt like I wasn't getting that. Not that that was the doctor's fault or the midwife's fault or anyone's fault, really. That was just nature doing what it does and out of our hands. (P199)

Being Heard: Women directly commented on "being heard" and having their concerns validated during the visit. They noted that the presence of the midwife empowered them to advocate for their preferences in addition to maternal/fetal safety. They were relieved that the practitioners understood that, while safety was the priority, their pregnancy and birth experience was also important.

I felt I was supported. I felt I was heard by both parties. I felt that, because I had initially chosen midwife care that her support was wonderful to have there. I felt very supported. I felt like it was a very good appointment. (P320)

Above and Beyond: Women expressed the visit exceeded their expectations of medical care. Women used positive descriptive euphemisms, including ‘above and beyond’ and ‘warm’ to describe their feelings about the collaborative visit.

Number one, it just made me feel like it went above and beyond. It's something that I don't expect out of the general medical community.... I have come to trust the people in the [midwife] office and so just have another friendly face and know that was on my side, was just a nice comforting thing. (P107)

Facets of Collaborative Care Needing Improvement—Women mentioned several areas for improvement. The most common suggestion centered on timely follow-up on labs and tests that were ordered at the collaborative visit. One woman stated that the midwife had contacted her to let her know that the labs were “a little bit off” and she would be forwarding the results to the MFM specialist. She felt this information and waiting to hear from the specialist unnecessarily increased her anxiety.

In addition, 3 women were concerned that the midwife did not have as much input into the plan of care as the MFM specialist.

I almost thought there was a little bit of a power imbalance that sort of maybe sort of stifled the dialogue just a little bit. (P354)

It is difficult to assess if the women simply wanted the midwife to be more vocal or if there was an actual power differential. In interviews with participating midwives, they did not comment on a sense of hierarchy. Instead, midwives described that the role of the MFM specialist was to provide detailed knowledge of maternal or fetal conditions, while the role of the midwife was to support the family, translate findings into plain language and implement the final plan of care.

Experiences of Providers

The original stakeholders, including clinic providers were interviewed 5 months after clinic implementation. Providers were uniformly pleased with the clinic format, stating that it improved care. They were confident that it had assisted the women in their practice in understanding the nature of collaboration between nurse-midwives and physicians.

“Well first of all, I think it is just keeping us safe. . . I am surprised at how often we need this consultation to direct the room, like actually to safely care for the patient. I think that this... helps the patients see MFM as allies and as welcome members of the health care team... I think it communicates really clearly that we are on the same team, which I think is one of the most effective things about the project...”

In addition, stakeholders felt regular contact improved the overall relationship between the two practices. The midwives were more willing to enlist MFM specialist input on women's care, and the MFM specialists had a greater understanding and trust of nurse-midwifery care.

Participant Perinatal Outcomes

Providers collaborated to determine whether midwifery, obstetrician, or specialist care was most appropriate for antepartum care. For most women, there was not a clear indication for immediate transfer, and the MFM specialist provided the woman and midwife with a detailed plan to guide further assessment. Seventy-eight percent (78%, n=39) of women were able to return to midwifery care. Only 18% of women (n=9) of women were transferred into MFM care following the collaborative visit, and one woman (2% of sample) was transferred to generalist OB care. (One woman planned to move after the collaborative visit and the subsequent provider was not noted.)

The preferred intrapartum provider was discussed at the time of visit; however, it was difficult to predict so far in advance. Of clinic participants, 68% (n=34) were admitted to the labor and birth unit by a midwife from the original practice, 16% (n=8) by a generalist OB, and 6% (n=3) by an MFM specialist. Five women (10% of participants) were lost to follow-up by the time of birth. All of those women were transferred to MFM care or had an unknown provider at the end of the collaborative visit; two women with unknown outcomes stated they planned to move before giving birth.

Key perinatal outcomes participants are shown in Table 3. There was 1 fetal death among participants that was reviewed by the hospital quality committee and the IRB and determined to be unrelated to collaborative care. Excluding the unrelated fetal death, participant outcomes were similar to the practice average of the CNM practice. Statistical testing was not performed to determine differences. The outcomes of the participants were also similar to hospital and national averages that include all women regardless of risk status. Of the 9 participants transferred to the MFM practice following the collaborative visit: 3 were lost to follow-up, 2 gave birth prior to hospital arrival, and 1 declined standard intrapartum care. (None of the women who gave birth outside of the hospital were able to be contacted for interviews.)

DISCUSSION

Using current evidence and stakeholder feedback, we developed a clinic for women receiving midwifery care needing a consult with a maternal-fetal medicine specialist. Study findings support that an in-person interprofessional collaborative visit is feasible and acceptable to women and providers. Women were satisfied with care as it improved communication and facilitated creation of an acceptable plan. Providers stated the clinic improved communication and collaboration for care of individual women and between the practices. This model of care is consistent with recommendations from the U.S. Centers for Medicare and Medicaid Services Expert Panel on Improving Maternal and Infant Health Outcomes, which called for the creation of patient-centered models of interdisciplinary prenatal care for at-risk women that include MFM specialist input.³¹

Women in this practice made a conscious decision to have a non-physician provider. There was a high rate of attrition from the group of women transferred to MFM care after the collaborative visit. Since the women did not respond to interview requests, the reasons for this attrition are not clear. It is possible that when women could not receive care with the

nurse-midwives or at their chosen practice, they transferred to a different practice or hospital that better fit their preferences. The fairly high rate of women who were transferred out of midwifery care giving birth outside of the hospital (2 out of 9) could signal that women delayed entry into the hospital as they were reluctant to enter the hospital environment. More research is needed on women's perceptions of transfer from midwifery care as this may be a vulnerable time for women.

The outcomes from this feasibility study of in-person collaborative care are promising. Women and providers were satisfied with the model and felt it enhanced prenatal care and improved communication. While the small sample precluded statistical testing, descriptive analysis of perinatal outcomes demonstrated that women in collaborative care had outcomes similar to the low-risk nurse-midwifery practice. Findings may be applicable to similar populations and settings.

There are many limitations to the study. We had a small sample size, though it was adequate to reach the saturation of findings consistent with qualitative research. The brief interviews with participants afforded the detail needed to obtain robust data on women's experience with the model in this location. As with any qualitative study, there is the potential for positive bias with the interviews, especially as the interviewer was a CNM. However, the positive experience of participants is also reflected in a steep reduction in women declining intrapartum recommendations and in complaints to hospital administration. Our sample is also not indicative of the larger national population of childbearing women as it overwhelmingly White and non-Hispanic, but it is similar to women who give birth outside the hospital in the US.²³ While our use of one location is also a limitation, this community-engaged study met its goal of providing a locally-acceptable solution for this system of care.

National and international organizations currently recommend a tiered approach to perinatal services to ensure women and newborns have access to appropriate providers and resources when needed but prevent overuse of interventions.^{4, 32, 33} Interprofessional and collaborative model of practice and provision of perinatal health services have the potential to decrease unnecessary interventions while increasing patient safety and engagement in care.^{31, 34} However, there are few published studies on collaborative, interprofessional models beyond a few case reports. This small-scale feasibility study contributes valuable information that simultaneous collaborative visits involving a nurse-midwife from the woman's chosen practice and an MFM specialist are logically feasible and improve communication among providers and pregnant women. While the perinatal outcomes in this study were favorable, a larger study with a control group is needed to assess the effect of this model on maternal and neonatal outcomes. This model has continued as standard of care for women at this practice with risk factors for poor perinatal outcomes receiving care, and a randomized trial of this model is planned. In addition, this intervention needs to be tested with a more culturally and economically diverse population.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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HIGHLIGHTS

In-person collaborative consultations are effective in improving communication among providers and women.

Women felt the collaborative visit allowed everyone to be ‘on the same page.’

Perinatal outcomes from this 50-participant feasibility study were promising, a larger study is needed to assess effectiveness.

Table 1**Inclusion and Exclusion Criteria**

<p>Inclusion Criteria</p> <p>Adult pregnant women receiving prenatal care at the VUSN Nurse-Midwifery Faculty Practice.</p> <p>Gestational age of pregnancy 4-40 weeks</p> <p>Needs a consultation with perinatologist for one of the following reasons:</p> <ul style="list-style-type: none"> Prior pregnancy with congenital abnormality History of fetal demise >20 weeks History of preterm labor in previous pregnancy Current maternal drug or alcohol abuse Controlled maternal condition (e.g. thyroid levels) Mild abnormality of fetus or placenta on ultrasound Idiopathic thrombocytopenia in pregnancy <p>Can attend the collaborative care clinic</p> <p>Exclusion Criteria</p> <p>Unable to give consent for research participation – including age < 18 or impaired mental function</p> <p>Urgent medical condition requiring immediate assessment including: ectopic pregnancy or vaginal bleeding</p> <p>Medical conditions outside of scope of VUSN midwifery guidelines including:</p> <ul style="list-style-type: none"> Chronic maternal conditions requiring specialist involvement including: HIV, epilepsy, uncontrolled asthma, and liver, renal, cardiac disease. Multiple gestation <ul style="list-style-type: none"> 2 previous cesarean births Rh isoimmunization Incompetent cervix Major fetal or placenta abnormalities <p>Woman desires termination of viable pregnancy</p> <p>Gestational age >40 weeks</p>

Table 2

Demographic Characteristics of Participants (Total N=50)

	Mean	Range
Age	30.3	19-42
Gestational age at first prenatal visit, weeks	9.28	4-23
Gestational age at collaborative visit, weeks	22.6	10-38

	Number	Percentage
Gravida		
1	13	36%
2	14	28%
3 or more	13	36%
Parity		
0	24	48%
1	15	30%
2 or more	11	22%
Racial/Ethnic Identification *		
White, Non-Hispanic	44	88%
White, Hispanic	1	2%
African American	3	6%
Asian	2	4%
Native American	2	6%
Insurance Payer		
Private (employer support)	41	82%
Medicaid (government support)	9	18%

* Total N >50 as women could identify multiple races

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Table 3

Selected Perinatal Outcomes for Participants in Comparison with Practice, Hospital, and National Averages.

Variable	Collaborative care ^a	Midwifery Practice average ^b	Hospital average ^b	National average ^c
Vaginal birth (spontaneous)	33 (73.3%)	733 (76%)	2704 (63.5%)	67.7%
Cesarean birth (primary and repeat)	8 (17.8%)	171 (18.9%)	1,553 (36.5%)	32.2%
Forceps or vacuum assisted birth	4 (8.8%)	45 (5%)	242 (5.7%)	-----
Preterm birth	2 (4.4%)	37 (4.1%)	625 (14.7%)	9.57%
Low birth weight (<2,500 grams)	3 (6.7%)	29 (3.2%)	593 (13.9%)	8.0%

^aBirths took place in 2015. Denominator is women with known outcomes (n=45).

^b2015 data. Denominator for midwifery practice average is 904 births. Denominator for hospital average is 4257.

^c2013 data³⁵ Denominator, all US births, 3,988,076