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Michigan Plan for Appropriate Tailored Healthcare in Pregnancy Prenatal Care Recommendations: A Practical Guide for Maternity Care Clinicians

Alex Friedman Peahl, MD, MSc[1,2,3], **Mark Turrentine, MD**[4], **Wanda Barfield, MD, MPH**[5], **Sean C. Blackwell, MD**[6], **Christopher M. Zahn, MD**[7]

[1]Department of Obstetrics and Gynecology, University of Michigan, Ann Arbor, Michigan, USA.

[2]Institute for Healthcare Policy and Innovation, University of Michigan, Ann Arbor, Michigan, USA.

[3]Program on Women's Healthcare Effectiveness Research (PWHER), University of Michigan, Ann Arbor, Michigan, USA.

[4]Department of Obstetrics & Gynecology, Baylor College of Medicine, Houston, Texas, USA.

[5]Division of Reproductive Health, National Center for Chronic Disease Prevention and Health Promotion, Centers for Disease Control and Prevention, Atlanta, Georgia, USA.

[6]Department of Obstetrics, Gynecology, and Reproductive Sciences, McGovern Medical School-UTHealth, Houston, Texas, USA.

[7]American College of Obstetricians and Gynecologists, Washington, District of Columbia, USA.

Abstract

Prenatal care is an important preventive service designed to improve the health of pregnant patients and their infants. Prenatal care delivery recommendations have remained unchanged since 1930, when the 12–14 in-person visit schedule was first established to detect preeclampsia. In 2020, the American College of Obstetricians and Gynecologists, in collaboration with the University of Michigan, convened a panel of maternity care experts to determine new prenatal care delivery recommendations. The panel recognized the need to include emerging evidence and experience, including significant changes in prenatal care delivery during the COVID-19 pandemic, pre-existing knowledge of the importance of individualized care plans, the promise of telemedicine, and the significant influence of social and structural determinants of health (SSDoH) on pregnancy outcomes. Recommendations were derived using the RAND-UCLA appropriateness method, a rigorous e-Delphi method, and are designed to extend beyond the acute public health crisis. The resulting *Michigan Plan for Appropriate Tailored Healthcare in pregnancy (MiPATH)* includes recommendations for key aspects of prenatal care delivery: (1) the recommended number of prenatal visits, (2) the frequency of prenatal visits, (3) the role of

Address correspondence to: *Alex Friedman Peahl, MD, MSc, Department of Obstetrics and Gynecology, University of Michigan, L4000 UH South, 1500 E. Medical Center Drive, Ann Arbor, MI 48109, USA*, alexfrie@med.umich.edu.

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monitoring routine pregnancy parameters (blood pressure, fetal heart tones, weight, and fundal height), (4) integration of telemedicine into routine care, and (5) inclusion of (SSDoH). Resulting recommendations demonstrate a new approach to prenatal care delivery that incorporates medical, SSDoH, and patient preferences, to develop individualized prenatal care delivery plans. The purpose of this document is to outline the new MiPATH recommendations and to provide practical guidance on implementing them in routine practice.

Keywords

antenatal care; pregnancy; prenatal care; remote monitoring; social and structural determinants of health; telemedicine

Introduction

In 2020, the American College of Obstetricians and Gynecologists (ACOG), in collaboration with the University of Michigan, convened a diverse panel of maternity care, public health, pediatrics, and equity experts, in addition to two patient representatives, from across the country to review prenatal care delivery for medically average-risk patients. Although the development of these recommendations was accelerated due to substantial changes in prenatal care during the COVID-19 pandemic, this guidance is meant to inform routine prenatal care beyond the acute public health crisis.

The panel utilized the RAND-UCLA appropriateness method,[1] a rigorous Delphi approach that incorporates existing evidence synthesized through a systematic review[2] with expert opinion where data are lacking.[2] The panel convened virtually to consider several key aspects of prenatal care delivery that have remained unchanged in the United States for almost a century: the number of recommended prenatal visits, the frequency of prenatal visits, the role of monitoring routine pregnancy parameters (blood pressure, fetal heart tones, weight, and fundal height), and integration of telemedicine into routine prenatal care.

In recognition of the significant impact of social and structural determinants of health (SSDoH) on pregnancy outcomes and care disparities in the United States, the panel also addressed how to integrate screening and management of these conditions into routine prenatal care. The panel recommended incorporating patient preference for care delivery recommendations where clinical equipoise exists, emphasizing the need for supporting a positive pregnancy experience in line with other international prenatal care recommendations.[3]

The resulting guidelines, the Michigan Plan for Appropriate Tailored Healthcare in pregnancy (MiPATH), provide a more nuanced flexible approach to prenatal care that matches recommended services to patients' medical and psychosocial needs.[4] Rather than accommodating assessments and interventions into a predetermined visit schedule, this new approach individually considers the components and implementation of prenatal care and optimizes it to meet individual patients' needs.

These flexible recommendations can be enacted through any care delivery model: traditional individual visits, group prenatal care, or pregnancy medical homes; any maternity care provider: physicians, midwives, nurse practitioners, or physician assistants; and any practice setting: those with high or low resources. MiPATH represents a paradigm shift in prenatal care delivery, replacing a one-size-fits-none model that has been associated with overutilization of low-value care and underutilization of high-value services.

Yet implementation of new approaches to prenatal care will require substantial practice change, from scheduling to clinician care planning. Furthermore, although the recommendations include telemedicine services and screening and management of psychosocial conditions, it is unclear how to deliver care when infrastructure for these services is not in place.

The purpose of this document is to summarize the MiPATH panel findings for clinicians, translate them into recommendations for practice, and address common questions and concerns about new recommendations. This represents the first step in developing a high-value patient-centered prenatal care approach that grows as new evidence accrues. The COVID-19 pandemic has demonstrated how care delivery *can* change to be more flexible; MiPATH provides the next step for formally integrating these changes as the standard for prenatal care.

Background

Which patients are considered average risk?

There is currently no uniform definition of an average-risk pregnancy in the United States. Most definitions refer to risk of complications at the time of delivery, but do not account for potential differences in level of required antenatal care services.[5–7] For the purposes of the panel, we developed a flexible pragmatic definition of average-risk pregnancy: “pregnancies without significant medical, pregnancy, or mental health conditions, that can be cared for by general maternity care clinicians (*e.g.*, Obstetrician-Gynecologists, Family Medicine Physicians, Certified Nurse Midwives, and Nurse Practitioners).

This definition may vary by region, practice, or clinician.” Thus, the same patient may be considered high or average risk depending on where and by whom care is delivered. Average-risk patients may include those with common conditions in pregnancy, such as chronic hypertension or gestational diabetes (Table 1), or having material or social concerns, such as food insecurity or mental health concerns.

What is prenatal care?

Prenatal care is one of the most common preventive services in the United States, utilized by 98% of the 4 million pregnant patients who give birth each year.[8] Prenatal care seeks to improve the health of pregnant patients and their infants through three key areas: (1) medical screening and treatment, (2) anticipatory guidance, and (3) psychosocial care, which was recently expanded to include support for SSDoH—nonmedical conditions that affect a patient’s ability to access and engage with care—to acknowledge the importance of upstream factors in maternity care outcomes (Fig. 1).[9–12] It is important to recognize

that prenatal care services have evolved significantly over the past century to include new technology such as ultrasound and genetic testing.[13–15]

Traditionally, prenatal care has been delivered through a standard 12–14 in-person visit schedule: monthly until 28 weeks, biweekly until 36 weeks, and weekly thereafter.[12] Although telemedicine has been increasingly incorporated in other specialties, prenatal care was largely delivered through in-person visits until the COVID-19 pandemic.

What is the evidence supporting prenatal care and its ability to improve maternal and infant outcomes?

There is good supporting evidence for many specific prenatal care services, such as screening and management of gestational diabetes and detection of Group B Streptococcus to prevent neonatal sepsis.[16–18] A recent systematic review highlights our limited knowledge of the connection between number of prenatal visits and pregnancy outcomes.[2] Existing data suggest a tenuous link between current prenatal care delivery and outcomes. A claims-based assessment of ~200,000 pregnant patients demonstrated no association between increased prenatal visits and receipt of guideline concordant services.[19] In addition, meta-analysis–level data demonstrate equal maternal and neonatal outcomes and fewer unnecessary interventions when prenatal visits are reduced from 14 to 9–10.[20,21]

Historically, the adequacy of prenatal care was determined by compliance with the number of planned visits, not services delivered—thus precluding accurate assessment of care quality.[22] In addition, SSDoH may negatively influence both patients' ability to present for care and their pregnancy outcomes, confounding any demonstrated relationship between prenatal care delivery and outcomes. Data on telemedicine in pregnancy are even more limited. Although initial trials demonstrate equivalent maternal and neonatal health outcomes and positive patient experience, data are limited to highly controlled trial settings in homogeneous populations.[2,23–25]

Monitoring for routine pregnancy parameters has not been considered outside of routine prenatal visits for average-risk patients, limiting understanding of the optimal intervals for collecting these measures. In addition, data are lacking on the utility of some pregnancy parameters for improving pregnancy outcomes, including fetal heart tones after maternal perception of fetal movement to establish fetal well-being and fundal height for detecting fetal growth.[26] These metrics may provide important reassurance for pregnant patients and their clinicians through both concrete data points and the "laying on of hands." Information on feasibility, acceptability, and accuracy of home monitoring devices for these parameters is promising but nascent.[2,23,25]

Why were new approaches needed?

Prenatal care delivery—specifically the 12–14 in-person visit schedule—has remained unchanged since 1930, when recommendations were first codified by the Children's Bureau to detect preeclampsia.[27] Despite significant changes in recommended services, availability of home monitoring, and international movement toward less intense prenatal visit schedules for average-risk patients, U.S. guidelines have persisted.[27–29]

Additional visits may be unnecessary, and even associated with increased intervention without maternal or neonatal benefit (*e.g.*, cesarean birth, induction of labor); patient opportunity cost (*e.g.*, lost wages, travel, and childcare costs)[28,30,31]; decreased clinic capacity (*e.g.*, fewer available appointments for high-risk patients requiring care); and, finally, reduced-value care (*e.g.*, increased cost of care without maternal or neonatal benefit).[21] The negative impact of unnecessary visits may be particularly felt by patients with barriers to care, such as low-income or rural patients. Flexible visit schedules, telemedicine, and group prenatal care have been proposed as promising strategies for addressing these issues in prenatal care delivery, but these models have failed to gain traction in the general maternity care community.[32–34]

The COVID-19 pandemic created an urgent need to maintain prenatal care delivery while conserving resources and maintaining social distancing. As a result, reduced visit schedules and telemedicine were rapidly implemented across the United States. Early data from these prenatal care models, while positive, are largely limited to observational studies that capture changes in utilization and patient and provider experience.[35–38]

MiPATH Panel Findings

Which aspects of prenatal care delivery were considered with the MiPATH panel?

The panel recognized the well-established evidence base for prenatal care *services*—the specific components of prenatal care delivered during prenatal visits (*e.g.*, laboratory tests, imaging). Thus, only prenatal care *delivery*—the methods by which prenatal care is administered, including visit timing (when visits are completed and how far apart) and modality (*e.g.*, in-person, telemedicine)—was considered. The panel recognized the importance of tailoring recommendations to patients' medical conditions, including chronic conditions and pregnancy complications, as well as SSDoH. Key recommendations are summarized in Figure 2.

Are these recommendations just for the COVID-19 public health crisis?

Although the COVID-19 pandemic provided the impetus for revised prenatal care approaches, recommendations are designed to extend beyond the resolution of the public health crisis. The panel recognized the need for further research on many aspects of prenatal care delivery, including best practices in telemedicine and methods for incorporating SSDoH into routine prenatal care.

Still, as neither the traditional 12–14 in-person visit model nor the new flexible models of prenatal care developed during the pandemic are supported by robust evidence, maternity care clinicians face clinical equipoise in selecting the best model for average-risk patients.[12,39] The panel concluded that prenatal care approaches should reflect this equipoise by allowing patients and clinicians to select appropriate prenatal care plans that balance individuals' risks and benefits.

How will prenatal care be delivered for an average-risk patient without medical or pregnancy conditions?

The MiPATH panel envisioned a new method of delivering prenatal care that includes tailored care schedules from the beginning of pregnancy based on an initial risk assessment *and* incorporation of patient preferences to ensure a safe positive patient experience (Fig. 3).

Risk assessment.—Recognizing that a patient's medical and SSDoH may not be known at the time of presentation, the prenatal care panel recommended completing a pregnancy risk assessment as soon as the patient contacts a clinic to establish care. Ideally, this assessment is completed by a trained member of the clinical team capable of assessing medical and SSDoH (*e.g.*, technician, nurse). The assessment can be completed in person or through telemedicine, between 6 and 10 weeks; however, if the patient presents for care after this time, the assessment should be completed as soon as possible. Figure 4 shows a detailed list of fields to be included in the risk assessment.

Prenatal visit and monitoring schedule.—Patients without medical conditions or adverse SSDoH should complete their first obstetrical ultrasound and prenatal visit between 7 and 10 weeks of gestation. Patients presenting after this interval should be scheduled as soon as possible. Patients and clinicians can select from a range of visit and monitoring intervals: 4–6 weeks for the first and second trimester (≥13 6/7 weeks to 27 6/7 weeks); 2–4 weeks for the early third trimester (28 0/7 weeks to 35 0/6 weeks); and 1–2 weeks for the late third trimester (≥36 0/7 weeks). Patients may select a more flexible or a more intense visit schedule equivalent to current care recommendations (Fig. 5).

Monitoring of all routine parameters can follow the selected visit schedule for average-risk patients. Monitoring of all routine pregnancy parameters (except fundal height in the first trimester) was considered *appropriate* by the panel; however, no conclusions were reached on which parameters were *required*.

Telemedicine.—To streamline in-person services, the panel identified four specific visits where all standard in-person prenatal care services can be accomplished (Fig. 1).[12] All other scheduled prenatal visits may be delivered through telemedicine if (1) the patient prefers this modality, (2) the patient and provider have the necessary technology to complete the visit through telemedicine, and (3) the patient has access to home devices to check relevant pregnancy parameters and has been appropriately trained to use them. Although video is preferred where possible, phone visits should be made available for patients without adequate broadband or smart devices. Clinicians should be aware of local and national telemedicine regulations.[40]

How will prenatal care be delivered for patients with medical or pregnancy conditions?

Patients with medical conditions may require additional contact with the health system, through increased visit frequency, more intense monitoring, or both. Clinicians should refer to existing documents for recommendations for antenatal testing.[18,41–44] The panel considered several representative diagnoses for pre-existing medical conditions (chronic hypertension, pregestational diabetes), conditions affecting the first trimester (history of

early pregnancy loss), and conditions affecting the second/third trimester (hypertensive disorders of pregnancy [HDP] and gestational diabetes). Although not exhaustive, clinicians can use these sample conditions when determining whether and how to increase the intensity of prenatal care for patients with medical conditions (Table 1).

For patients with hypertension and diabetes, the first prenatal visit may be scheduled as early as 6 weeks to optimize disease control. Visit frequency should match the traditional prenatal care guidelines. Notably, the recommended frequency for *monitoring* blood pressure for patients with chronic hypertension in the second and early third trimester is more frequent than the recommended *visit* schedule, so clinicians and patients must coordinate a plan for home monitoring that includes a high-quality home blood pressure cuff and a method to communicate abnormal results. If this is not possible, additional in-person visits may be scheduled.

For patients with a history of an early pregnancy loss, the first prenatal visit may be scheduled at 6 weeks, with more frequent visits in the first and second trimester, to provide patient reassurance and early detection of pregnancy loss. Recommendations for the third trimester remain unchanged. For patients who develop pregnancy-associated complications, including HDP and gestational diabetes, care intensity (*e.g.*, visit frequency and monitoring) should be increased at the time of diagnosis to match the traditional visit schedule.

How should the prenatal schedule be adapted for patients with adverse SSDoH?

National organizations, including the U.S. Preventive Services Task Force and the National Academy of Medicine, as well as the MiPATH panel, recognize the importance of addressing SSDoH in routine health care.[45,46] Not all prenatal care needs can be best met through prenatal visits; some SSDoH may be better addressed by other members of the care team or community.[47–50] Although the MiPATH panel acknowledged the importance of addressing SSDoH in routine prenatal care, how to do so was less clear.

The panel agreed that simply screening is inadequate; it is important to ensure that patients' identified needs can be sufficiently addressed. This may be accomplished through resources available within the office (*e.g.*, connecting a patient with food insecurity to a women, infants, and children representative collocated in the clinic) or community resources (*e.g.*, referring a patient with low social support to a local support group). If patients' needs can be met, modifications to routine prenatal care schedules are rarely needed, although special considerations should be made for patients with low health literacy or pregnancy-related anxiety, who may benefit from more intense contact with the health system.

The panel's recommendations were less certain when health system and community resources are not available to meet patients' needs. In these cases, patients and clinicians may select the traditional prenatal visit schedule for close follow-up, although additional prenatal visits may not alleviate patients' needs and may create greater burden. Clinicians should be particularly mindful of telemedicine visits for victims of intimate partner violence, as prenatal visits may be the only opportunity for patients to be away from the abusive situation. Although SSDoH are crucial for maternal and neonatal outcomes, how to best integrate screening and management into routine pregnancy requires rigorous exploration.

Examples of team-based care from pediatrics and other primary care specialties provide promising directions to consider for the future.[48,51–54]

What if a practice does not routinely screen for SSDoH?

Although ACOG and health policymakers have recommended screening for SSDoH for over a decade, this practice is still not routinely incorporated into prenatal care.[55,56] Clinicians can reference ACOG Committee Opinion 729 for further information, including recommended free screening tools for practice.[47] However, as there is currently no comprehensive efficient assessment of SSDoH in pregnancy, clinicians may consider selecting from assessments used in other specialties that best match their populations.[57]

One of the major challenges facing clinicians is management of a positive screen for adverse SSDoH. Identifying conditions is an important first step, and acknowledging patients' difficulties may itself provide some therapeutic benefit.[58,59] Still, connecting the patient to appropriate services is necessary to successfully address social, systemic, and structural barriers to optimizing health.[60,61] Clinicians should consider local partnerships through their health system, community, public health infrastructure, and ACOG district or section to identify promising resources for meeting patients' needs. Future study is needed to identify best strategies for integrating screening and management of SSDoH into routine prenatal care.[62–64]

What should I do If my patient presents after the recommended time for the first prenatal visit?

Recommendations for care initiation presented in this document are for the ideal timing; however, if patients present later than this, they should be scheduled as soon as possible. It is crucial that patients are welcomed into care whenever they present, regardless of the timing.[65] If a patient presents in a timely manner but cannot be scheduled before recommended intervals due to clinic capacity, the clinic should consider referring the patient to another location for care if available.

What if my practice does not have available telemedicine infrastructure?

Clinicians interested in adding telemedicine services to their practice should reference ACOG Committee Opinion 798 for further information on telemedicine considerations, including legal and regulatory issues, billing and payment, and licensing and equipment requirements.[40] In this setting, patients and clinicians may still select flexible visit schedules and phone visits, even if formal telemedicine platforms are not available.

What home devices are required for patients receiving telemedicine prenatal visits?

The panel did not provide definitive recommendations on which monitoring parameters were *required* for prenatal visits; thus, clinicians may use their judgment to decide which home devices are needed. Most prenatal care models have at minimum incorporated home blood pressure monitoring given the importance of early detection of HDP.[23,36,38] The utility of other parameters, including fetal heart tones, weight, and fundal height, is less clear; thus, these can be a point of shared decision making between patient and clinician.

Patients may obtain home devices through a durable medical equipment benefit, a health savings account, or personal purchase. Insurance coverage of home devices for prenatal care is currently limited for both commercial and public payers, which threatens to deepen existing health disparities—preventing patients with financial insecurity from accessing more flexible models of care.[66,67] Further advocacy is needed to ensure that home devices are automatically covered for pregnant patients.[38] While awaiting policy change, clinicians and health systems can explore opportunities for donated devices to prevent deepening the digital divide.[68]

Future Research and Policy Directions

Current guidelines represent an important step toward more tailored models of prenatal care; however, there is a pressing need for further research. Future study must assess the impact of visit frequency, monitoring, and telemedicine on pregnancy outcomes, patient satisfaction, care access, and disparities. Data must be collected in diverse real-world settings to enhance generalizability and understanding of context-specific factors that may impact care delivery.

Continuation of flexible prenatal care models requires maintenance of regulatory and payment policies introduced during the COVID-19 pandemic. Similarly, coverage of telemedicine services, home devices, and social services will be crucial for supporting comprehensive prenatal care models that meet patients' diverse needs. In addition, there may be concern that fewer prenatal visits may lead to reduced reimbursements for provision of obstetric care.

It is important to emphasize that fewer visits do not mean less care is provided. The work of this panel was to consider new approaches to the *delivery* of prenatal are, not the *provision* of care. The same assessments, anticipatory guidance, and monitoring are being provided as they were in the traditional approach, but in an altered visit schedule. Reimbursement should be based on the care being provided, not simply the number of visits.

The primary purpose of the MiPATH panel was to establish the ideal prenatal care delivery model; however, the panel also recognized that implementation of these paradigm-changing recommendations may be challenging for maternity care practices—particularly those with insufficient resources, less robust infrastructure, and limited personnel to enact changes. Thus, there is an urgent need to better understand the barriers and facilitators to realization of MiPATH recommendations. The panel has planned a national listening tour to engage key stakeholders at the patient, maternity care professional, payer, and policy levels to identify critical tools and supports needed for widespread implementation of MiPATH in real-world practice.

Summary and Conclusion

Substantial changes in prenatal care during the COVID-19 pandemic have demonstrated that new approaches to prenatal care are possible. The MiPATH recommendations provide new guidance on visit scheduling, routine monitoring, telemedicine, and incorporation of SSDoH into routine care. Although these individualized comprehensive prenatal care plans have the potential to improve health outcomes, patient experience, and care value, they require

further study. The MiPATH panel will be reconvened iteratively to incorporate stakeholder feedback, emerging data, and the results of an ongoing Agency for Healthcare Research and Quality systematic review to ensure recommendations continue to evolve with growing evidence.

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Service	Weeks																
	6-10*	12	14	16	18	20	22	24	26	28*	30	32	34	36*	38	39*	40
History/Exam	History and physical															Cervical check	
Labs	First TM labs; Genetic screening			Genetic screening				Diabetic screen; CBC; Antibody screen†						GBS screen			
Imaging	First TM US				Anatomy US									Assess presentation			
Injections	Influenza†									TDap vaccination							
										RhIG							
Anticipatory guidance‡	First TM education	Second TM education								Third TM education							
																Delivery planning	
Social and structural determinants§	Screen and connect to services																

FIG. 1.

Recommended prenatal care services by gestational age (adapted from the current American College of Obstetricians and Gynecologists Antepartum Record). *Four key contact points identified by the MiPATH panel as minimum required in-person visits to complete recommended prenatal care services. †As indicated. ‡Education about pregnancy, childbirth, the postpartum period, and parenting (*e.g.*, counseling and educational materials). §Identification of social, emotional, and material needs that may affect the pregnancy and connection to appropriate resources (*e.g.*, screening for depression and substance use). CBC, complete blood count; GBS, Group B Streptococcus; MiPATH, Michigan Plan for Appropriate Tailored Healthcare in pregnancy; RhIG, Rho(D) immunoglobulin; TDap, tetanus diphtheria and pertussis vaccine; TM, trimester; US, ultrasound.

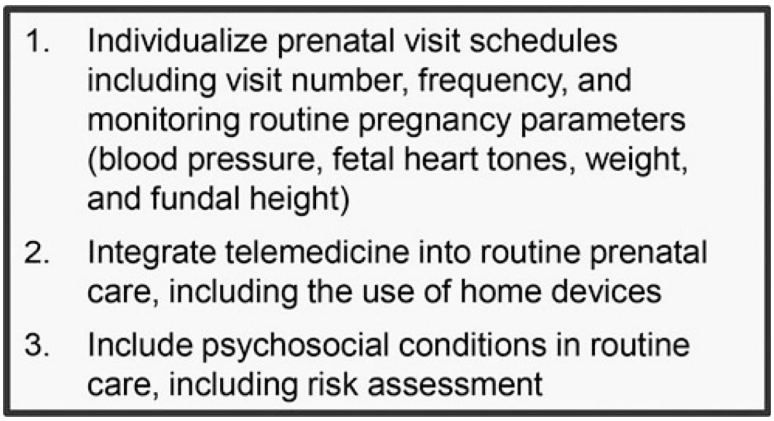

FIG. 2.
Key prenatal care recommendations of the MiPATH panel.

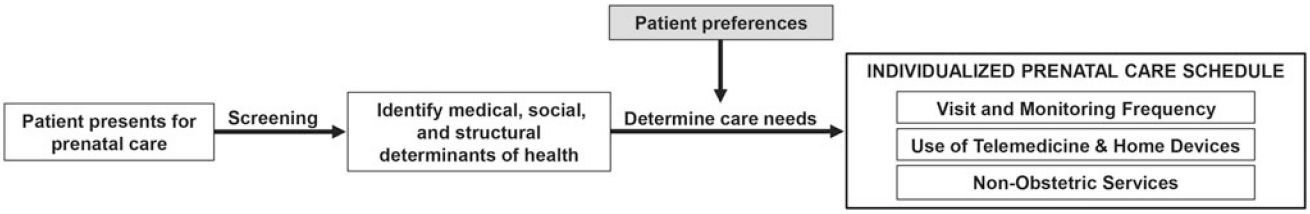

FIG. 3.

Schematic for incorporating pregnant people's risk and preference into prenatal care schedules.

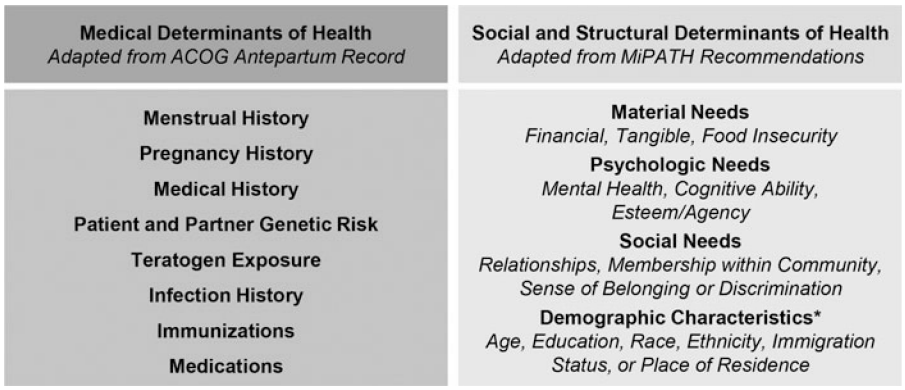

FIG. 4.

Fields to be included in pregnancy risk assessment. *By which one may experience discrimination or limitations in accessing care. ACOG, American College of Obstetricians and Gynecologists.

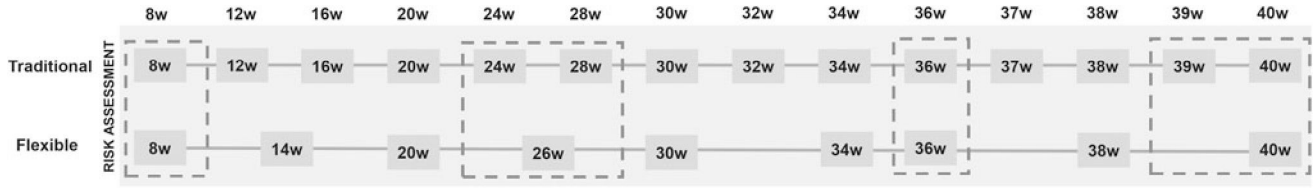

FIG. 5.
Prenatal visit schedule options for average-risk patients.

Table 1.

Timing of Initiation of Care and Visit Frequency in the Original and Michigan Plan for Appropriate Tailored Healthcare in Pregnancy Prenatal Care Recommendations

	Prenatal service timing		Prenatal visit frequency[a]			
Condition	**First prenatal visit**	**First ultrasound**	**≤13 6/7 weeks**	**14 0/7 weeks to 27 6/7 weeks**	**28 0/7 weeks to 35 6/7 weeks**	**≥36 0/7 weeks**
Current guidelines	First trimester	First trimester	4 weeks	4 weeks	2 weeks	1 week
Average risk	7–10 weeks	7–10 weeks	4–6 weeks	4–6 weeks	2–4 weeks	1–2 weeks
Chronic hypertension	6–10 weeks	6–10 weeks	4 weeks	4 weeks[b]	2 weeks	1 week
Pre-existing diabetes	6–10 weeks	6–10 weeks	4 weeks	4 weeks	2 weeks	1 week
History of early pregnancy loss	6–10 weeks	6–10 weeks	4 weeks	4 weeks	N/A	N/A
Gestational hypertension	N/A	N/A	N/A	N/A	1 week	1 week
Gestational diabetes	N/A	N/A	N/A	N/A	2 weeks	1–2 weeks

[a] Unless otherwise specified, frequency of monitoring routine parameters should match visit frequency.

[b] Recommended monitoring is more frequent than visit schedule (every 1–2 weeks for blood pressure).

N/A, no recommendation for this time point.

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