



Topic Brief: Antenatal Care

Date: 6/30/2020

Nomination Number: 0902

Purpose: This document summarizes the information addressing a nomination submitted on April 7, 2020 through the Effective Health Care Website. This information was used to inform the Evidence-based Practice Center (EPC) Program decisions about whether to produce an evidence report on the topic, and if so, what type of evidence report would be most suitable.

Issue: There is a lack of current evidence-based guidance about the appropriate number and frequency of antenatal care visits for women with uncomplicated pregnancies. Standard practice in the United States consists of monthly antenatal care visits during the first 28 weeks of pregnancy followed by twice weekly visits until 36 weeks, and weekly visits thereafter. This is based largely on tradition, though different models have been studied¹. There has also been an increase in the use of telehealth to replace in-person antenatal care visits which warrants further exploration, especially in light of the current COVID-19 pandemic².

Program Decision: The EPC Program will develop a new systematic review based on this nomination. The scope of this topic will be further developed in the refinement phase, and may need to consider the content and services provided during antenatal visits in addition to the timing and frequency. When key questions have been drafted, they will be posted on the AHRQ Web site and open for public comment. To sign up for notification when this and other Effective Health Care (EHC) Program topics are posted for public comment, please go to <https://effectivehealthcare.ahrq.gov/email-updates>.

Key Findings

Two key questions (KQs) were formulated to address the nominator's needs. No existing systematic reviews were identified that addressed the appropriate schedule of in-person antenatal care visits for uncomplicated pregnancies (KQ1). Two reviews were found which covered part of the question about the use of telehealth in antenatal care (KQ2). No reviews were identified which covered the total scope of KQ2. The primary studies found were about the use of telehealth in antenatal care. Some of these studies explored using telehealth to reduce the frequency of in-person antenatal visits.

Background

- Antenatal care reduces maternal and perinatal morbidity and mortality by identifying risks and preventing and managing pregnancy-related or concurrent health problems³. With over 3 million births in the United States in 2018, the provision of antenatal care affects the health of many women and represents significant healthcare costs.

- Some health systems in the United States and other countries have adapted different antenatal care schedules for uncomplicated pregnancies⁴. The nominator of this topic would like to use a systematic review to inform their antenatal care guideline development.
- Some health systems have also implemented telehealth obstetric services⁵. In the prenatal period, these include using videoconference to replace in-person visits, implementing at-home monitoring, and enabling consultation with remote specialists.

Scope

1. What is the effectiveness of antenatal care schedules that vary by number of visits for uncomplicated pregnancies?
2. What is the effectiveness of telehealth for providing antenatal care for uncomplicated pregnancies?

Table 1. Questions and PICOTS (population, intervention, comparator, outcome, timing and setting)

Questions	1. Antenatal care schedules	2. Telehealth for antenatal care
Population	Pregnant women considered to be at low risk of developing complications during pregnancy and labor. Subgroups of women: <i>Age, race/ethnicity, socioeconomic status</i> Exclude: Studies that include primarily women considered high risk for complications during pregnancy	Pregnant women considered to be at low risk of developing complications during pregnancy and labor. Subgroups of women: <i>Age, racial/ethnicity, socioeconomic status</i> Exclude: Studies that include primarily women considered high risk for complications during pregnancy
Interventions	Antenatal care programs with alternate number of in-person visits, or visits based on content [service provided] rather than absolute number <i>(Consider the number, frequency, schedule and service provided. Also consider service provider)</i>	Antenatal care programs using telehealth (e.g. virtual consultation, remote monitoring of blood pressure and diabetes, weight management and activity monitoring) <i>(Consider how telehealth is used-as an adjunct/additional visits over and above the “routine” visit, or instead of a “routine visit”)</i>
Comparators	Standard or routine antenatal care program (as defined by the study) <i>(Consider the number, frequency, schedule and service provided. Also consider service provider)</i>	Standard or routine antenatal care program (as defined by the study) <i>(Consider the number, frequency, schedule and service provided. Also consider service provider)</i>

Questions	1. Antenatal care schedules	2. Telehealth for antenatal care
Outcomes	Maternal outcomes: Attendance at antenatal visit Access to care Patient satisfaction with antenatal care Maternal morbidity (e.g. gestational hypertension, pre-eclampsia, mental health outcomes) Maternal mortality Quality of life outcomes including stress and anxiety Fetal/neonatal outcomes: Mortality; morbidity (e.g. pre-term birth, low birth weight, admission to NICU) Cost/resource use outcomes: (e.g., number of visits/referrals, hospital admissions, length of stay) Provider outcomes: Provider satisfaction with antenatal care visits	Maternal outcomes: Attendance at antenatal visit Access to care Patient satisfaction with antenatal care Maternal morbidity (e.g. gestational hypertension, pre-eclampsia, mental health outcomes) Maternal mortality Quality of life outcomes including stress and anxiety Fetal/neonatal outcomes: Mortality; morbidity (e.g. pre-term birth, low birth weight, admission to NICU) Cost/resource use outcomes: (e.g., number of visits/referrals, hospital admissions, length of stay) Provider outcomes: Provider satisfaction with antenatal care visits/use of telehealth
Timing	Any	Any
Setting	Any. Consider country of study setting and rural/urban location of study setting.	Any. Consider country and rural/urban location of study setting

Abbreviations: NICU=Neonatal Intensive Care Unit.

Assessment Methods

See Appendix A.

Summary of Literature Findings

No systematic reviews were identified for KQ1. Two reviews were found relating to the use of telehealth in antenatal care (KQ2). One of these reviews explored the safety and efficacy of home blood pressure monitoring during pregnancy, and included pregnancies with hypertensive disorder or those at increased risk of developing hypertensive disorder⁶. Another recently updated systematic review explored the use of telehealth in antenatal care, but only included studies of women with gestational diabetes, with the primary outcome of glycemic control⁷. No systematic reviews were identified which comprehensively covered the use of telehealth in antenatal care for uncomplicated pregnancies.

Nine primary studies were identified based on our random sample of the available literature, which indicates there may be approximately forty primary studies included in a new systematic review of this topic.

The studies identified for KQ2 described various approaches to telehealth-delivered antenatal care, including remote patient monitoring of weight and blood pressure and using telehealth visits to replace office visits. No studies were found which specifically compared frequencies or schedules of in-person antenatal visits without a telehealth component. Two studies explored technology-enhanced, reduced prenatal visit models^{8,9}. Six of the nine studies were observational studies and explored outcomes such as patient and provider satisfaction with telehealth and remote monitoring, compliance with remote blood pressure monitoring, and patient-related cost and time savings associated with the use of telehealth.

Table 2. Literature identified for each Question

Question	Systematic reviews (6/2017-6/2020)	Primary studies (6/2015-6/2020)
Question 1: Antenatal care schedules	Total: 0 <ul style="list-style-type: none"> • Cochrane: 0 • AHRQ: 0 • Other: 0 	Total: 0 <ul style="list-style-type: none"> • RCT: 0 • Controlled pre-post: 0 Clinicaltrials.gov <ul style="list-style-type: none"> • Recruiting: 0
Question 2: Telehealth for antenatal care	Total: 2 <ul style="list-style-type: none"> • Cochrane: 0 • AHRQ: 0 • Other: 2^{6,7} 	Total: 9 ⁸⁻¹⁶ <ul style="list-style-type: none"> • RCT: 3^{8,9,15} • Observational: 6^{10-14,16} Clinicaltrials.gov <ul style="list-style-type: none"> • Recruiting: 0

Abbreviations: AHRQ=Agency for Healthcare Research and Quality; RCT=randomized controlled trial.

See Appendix B for detailed assessments of all EPC selection criteria.

Summary of Selection Criteria Assessment

This nomination meets all selection criteria for consideration for a new systematic review. Two systematic reviews which covered part of KQ2 were identified. There were no reviews relating to KQ1, and none of the reviews provided a comprehensive synthesis of evidence about the use of telehealth in antenatal care (KQ2). A new systematic review that synthesizes the evidence base could inform decision making about the most effective schedule of antenatal care visits for uncomplicated pregnancies, taking into consideration that the content of (or service provided at) visits could drive the timing and frequency of visits. Furthermore, the various uses of telehealth in antenatal care could be defined in a systematic review. The development of a new systematic review is feasible because there are primary studies which address, for example, remote monitoring of weight, blood pressure and diabetes and virtual consultations. A new review would be highly impactful and valuable: the nominator plans to use a systematic review to inform a consensus conference with the aim of developing clinical recommendations and a plan for dissemination. Based on our literature search results, we estimate that there are 40 primary studies about the frequency and use of telehealth in antenatal care visits. Studies which compared different antenatal visit schedules all involved an element of telehealth. It is uncertain whether a full comprehensive search would identify any studies that compare different numbers of standard antenatal in-person office visits.

Please see Appendix B for detailed assessments of individual EPC Program selection criteria.

Related Resources

We identified additional information in the course of our assessment that might be useful to the nominator.

Published literature:

- A recent review of advances in obstetric monitoring (including studies of high-risk pregnancies) may be of interest to the nominator as it describes the contributions and limitations of obstetric telemonitoring using mobile technologies¹⁷.
- Three recent systematic reviews of mHealth technology for supporting healthy lifestyles during pregnancy may be of interest to the nominator¹⁸⁻²⁰.

- A synthesis of qualitative evidence has been published regarding the provision and uptake of routine antenatal services²¹.
- A systematic review of shared medical appointments included studies about group prenatal care²². One further study of group prenatal care was identified during topic development but was not relevant to the key questions²³.

Guidelines:

- The updated United Kingdom National Institute for Health and Care Excellence guideline on antenatal care is due to be published in April 2021, with updated evidence searches for the questions about the most effective timing and frequency of antenatal care appointments (see <https://www.nice.org.uk/guidance/indevelopment/gid-ng10096>).

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Author

Jennifer Hilgart

Conflict of Interest: None of the investigators have any affiliations or financial involvement that conflicts with the material presented in this report.

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Appendix A: Methods

We assessed nomination for priority for a systematic review or other AHRQ Effective Health Care report with a hierarchical process using established selection criteria. Assessment of each criteria determined the need to evaluate the next one. See Appendix B for detailed description of the criteria.

Appropriateness and Importance

We assessed the nomination for appropriateness and importance.

Desirability of New Review/Absence of Duplication

We searched for high-quality, completed or in-process evidence reviews published in the last three years June 2017 to June 2020 on the questions of the nomination from these sources:

- AHRQ: Evidence reports and technology assessments
 - AHRQ Evidence Reports <https://www.ahrq.gov/research/findings/evidence-based-reports/index.html>
 - EHC Program <https://effectivehealthcare.ahrq.gov/>
 - US Preventive Services Task Force <https://www.uspreventiveservicestaskforce.org/>
 - AHRQ Technology Assessment Program <https://www.ahrq.gov/research/findings/ta/index.html>
- US Department of Veterans Affairs Products publications
 - Evidence Synthesis Program <https://www.hsrd.research.va.gov/publications/esp/>
 - VA/Department of Defense Evidence-Based Clinical Practice Guideline Program <https://www.healthquality.va.gov/>
- Cochrane Systematic Reviews <https://www.cochranelibrary.com/>
- PROSPERO Database (international prospective register of systematic reviews and protocols) <http://www.crd.york.ac.uk/prospéro/>
- PubMed <https://www.ncbi.nlm.nih.gov/pubmed/>
- PCORI <https://www.pcori.org>
- Joanna Briggs Institute <http://joannabriggs.org/>

Impact of a New Evidence Review

The impact of a new evidence review was qualitatively assessed by analyzing the current standard of care, the existence of potential knowledge gaps, and practice variation. We considered whether it was possible for this review to influence the current state of practice through various dissemination pathways (practice recommendation, clinical guidelines, etc.).

Feasibility of New Evidence Review

We conducted a limited literature search in PubMed for the last five years (June 2015 to June 2020). Because a large number of articles were identified (n=1675), we reviewed a random sample of 200 titles and abstracts for each question for inclusion. We classified identified studies by question and study design, to assess the size and scope of a potential evidence review. We then calculated the projected total number of included studies based on the proportion of studies included from the random sample.

Search strategy

MEDLINE ALL (Ovid) 1946 to June 10, 2020

Date searched: June 11, 2020

1 Prenatal Care/ or exp Pregnancy Trimesters/ or Pregnant Women/ (74047)

2 (antenatal or ante-natal or gestation or gestational or pregnancy or pregnancies or pregnant or prenatal or pre-natal or trimester).ti,kf. (342228)
3 or/1-2 (369118)
4 Office Visits/ or Delivery of Health Care/ or Standard of Care/ (99172)
5 (appointment* or consult* or office or ((model or models or package or packages or standard or standards) adj5 care) or routine or service or services or schedul* or visit*).ti,kf. (288966)
6 3 and 5 (6420)
7 (meta analysis or "systematic review").pt. (191121)
8 (metaanaly* or meta-analy* or ((evidence or systematic) adj3 (review or synthesis))).ti,ab,kf. (302062)
9 or/7-8 (324577)
10 and/6,9 (155)
11 limit 10 to yr="2017 -Current" (61)
12 limit 11 to english language (59)
13 exp Telemedicine/ or Remote Consultation/ or Telemetry/ (37174)
14 (apps or ehealth* or mhealth* or tele* or internet or mobile or online or phone or phones or remote* or "social media" or skype or technology* or video* or virtual* or web).ti,kf. (289381)
15 or/13-14 (302228)
16 and/3,15 (2538)
17 9 and 16 (125)
18 limit 17 to yr="2017 -Current" (70)
19 limit 18 to english language (70)

EBM Reviews - Cochrane Database of Systematic Reviews 2005 to June 03, 2020

Date searched: June 11, 2020

1 (antenatal or ante-natal or gestation or gestational or pregnancy or pregnancies or pregnant or prenatal or pre-natal or trimester).ti. (353)
2 (appointment* or consult* or office or ((model or models or package or packages or standard or standards) adj5 care) or routine or service or services or schedul* or visit*).ti. (174)
3 and/1-2 (7)
4 limit 3 to last 3 years (2)
5 (apps or ehealth* or mhealth* or tele* or internet or mobile or online or phone or phones or remote* or "social media" or skype or technology* or video* or virtual* or web).ti. (126)
6 and/1,5 (1)
7 limit 6 to last 3 years (0)

Prospero

Date searched: June 11, 2020

((antenatal OR ante-natal OR gestation OR gestational OR pregnancy OR pregnancies OR pregnant OR prenatal OR pre-natal OR trimester) AND (appointment* OR consult* OR office OR model OR models OR package OR packages OR standard OR standards OR care OR routine OR service OR services OR schedul* OR visit*)):TI WHERE CD FROM 11/06/2017 TO 11/06/2020 (68)

Value

We assessed the nomination for value. We considered whether or not the clinical, consumer, or policymaking context had the potential to respond with evidence-based change; and if a partner organization would use this evidence review to influence practice.

Appendix B. Selection Criteria Assessment

Selection Criteria	Assessment
1. Appropriateness	
1a. Does the nomination represent a health care drug, intervention, device, technology, or health care system/setting available (or soon to be available) in the United States?	Yes
1b. Is the nomination a request for an evidence report?	Yes
1c. Is the focus on effectiveness or comparative effectiveness?	Yes
1d. Is the nomination focus supported by a logic model or biologic plausibility? Is it consistent or coherent with what is known about the topic?	Yes
2. Importance	
2a. Represents a significant disease burden; large proportion of the population	Yes, in 2018 there were 3,791,712 births in the United States.
2b. Is of high public interest; affects health care decision making, outcomes, or costs for a large proportion of the United States population or for a vulnerable population	Yes, antenatal care is of high public importance and affects health outcomes of vulnerable populations (pregnant women and their infants).
2c. Incorporates issues around both clinical benefits and potential clinical harms	Yes
2d. Represents high costs due to common use, high unit costs, or high associated costs to consumers, to patients, to health care systems, or to payers	Yes
3. Desirability of a New Evidence Review/Absence of Duplication	
3. A recent high-quality systematic review or other evidence review is not available on this topic	No systematic reviews were identified for KQ1. Two reviews for KQ2 were identified. However, they focused on a specific intervention (e.g. home blood pressure monitoring for pregnancies with or at risk for hypertension disorders of pregnancy) and populations (e.g. women with gestational diabetes). No comprehensive reviews were identified which covered the total scope of the use of telehealth in antenatal care.
4. Impact of a New Evidence Review	
4a. Is the standard of care unclear (guidelines not available or guidelines inconsistent, indicating an information gap that may be addressed by a new evidence review)?	Yes. The current guideline for the number of antenatal care visits is based on traditional practice and not on an assessment of the available literature. There is no known evidence-based guidance about the use of telehealth for antenatal care in the United States
4b. Is there practice variation (guideline inconsistent with current practice, indicating a potential implementation gap and not best addressed by a new evidence review)?	Yes. Some health systems have developed different schedules of antenatal care visits for uncomplicated pregnancies. An evidence based guideline would inform current practice.
5. Primary Research	
5. Effectively utilizes existing research and knowledge by considering: - Adequacy (type and volume) of research for conducting a systematic review - Newly available evidence (particularly for updates or new technologies)	From our limited sample of the literature, one primary study was identified for KQ1 and eight studies for KQ2. We estimate approximately 40 studies will be identified for a new systematic review on this topic. Telehealth in antenatal care especially appears to be a topic of exploration within current studies.
6. Value	

Selection Criteria	Assessment
6a. The proposed topic exists within a clinical, consumer, or policy-making context that is amenable to evidence-based change	Yes, the current antenatal pathway in the US is not based on a synthesis of the current evidence. Some health systems have implemented modified antenatal visit schedules, which suggests that practice would be amenable to change.
6b. Identified partner who will use the systematic review to influence practice (such as a guideline or recommendation)	Yes, ACOG and SMFM nominated this topic in order to convene an evidence-informed consensus conference to develop clinical recommendations on the number and frequency of antenatal visits for uncomplicated pregnancies and the use of telehealth for antenatal care.

Abbreviations: ACOG =American College of Obstetricians and Gynecologists; AHRQ=Agency for Healthcare Research and Quality; KQ=key question; SMFM=Society for Maternal and Fetal Medicine.