Effect of Frequency of Prenatal Care Visits on Perinatal Outcome Among Low-Risk Women

A Randomized Controlled Trial

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Objectives.—In 1989, the Expert Panel on the Content of Prenatal Care established guidelines on the timing and content of prenatal care, including a schedule consisting of fewer prenatal visits than traditionally provided, for women at low risk of adverse perinatal outcomes. We tested the hypothesis that there are no significant increases in adverse perinatal outcomes when low-risk women are seen in a prenatal care visit schedule of fewer visits than routinely advised.

Design.—Randomized controlled trial.

Setting.—Group-model health maintenance organization.

Patients.—A total of 2764 pregnant women, judged to be at low risk of adverse perinatal outcomes.

Interventions.—Following risk assessment, participants were randomly assigned to an experimental schedule (nine visits) or a control schedule (14 visits) with additional visits as indicated or as desired by the patient.

Main Outcome Measures.—Preterm delivery, preeclampsia, cesarean delivery, low birth weight, and patients' satisfaction with care.

Results.—On average, there were 2.7 fewer visits observed in the experimental group than in the control group. There were no significant increases in the main outcomes of the experimental group: preterm delivery (relative risk [RR], 1.08; 95% confidence interval [CI], 0.92 to 1.27; P=.19), preeclampsia (RR, 0.94; 95% CI, 0.78 to 1.14; P=.74), cesarean delivery (RR, 1.04; 95% CI, 0.93 to 1.17; P=.25), and low birth weight (RR, 0.94; 95% CI, 0.78 to 1.12; P=.76). There were no differences between the two groups in patients' satisfaction with quality of prenatal care.

Conclusion.—In this study, good perinatal outcomes and patient satisfaction were maintained when the prenatal visit schedule proposed by the Expert Panel on the Content of Prenatal Care was observed.

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THE BENEFICIAL effects of prenatal care on pregnancy outcome have been described in many observational studies over several decades.[1-9] However, the ways in which the timing and content of this care contribute to outcome are not well understood.[10] Although perinatal mortality rates in the United States and Europe are similar, there is great variation in the number of prenatal visits recommended for uncomplicated pregnancies. Estimates range from a low of three to four in Switzerland to a high of 14 in Finland, Norway, and the United States.[11] The American College of Obstetricians and Gynecologists has previously endorsed a schedule of 14 visits for low-risk women who present in the first trimester.[12] In the United States, there are currently over 4 million births annually,[13] thus making prenatal care one of the most important services offered to the population. The impact of these services on the cost of health care is considerable.

In the United States, the planned schedule of visits in routine prenatal care evolved in response to the problem of preeclampsia.[10,14] Traditionally, more visits have been scheduled in the third trimester for detection of maternal signs of toxemia. In 1989, the Expert Panel on the Content of Prenatal Care, a multidisciplinary panel convened by the Public Health Service, published recommendations on the timing and content of prenatal care.[15] This panel was drawn from many sectors of the health care system and was balanced for knowledge of medical care, statistics, study design, and psychosocial support issues. After a thorough review and discussion of the literature, the panel recommended a new schedule for healthy, low-risk women, which combined visits for risk assessment and health promotion into fewer visits than previously recommended.

Accordingly, we sought to evaluate the schedule proposed by the Expert Panel on the Content of Prenatal Care. In a randomized controlled trial, we tested the hypothesis that there are no significant increases in adverse perinatal outcomes when, following risk assessment, low-risk women are seen in a prenatal visit schedule of fewer visits than those routinely provided.

METHODS

This trial was conducted in the Colorado Region of Kaiser Permanente following approval by the Kaiser Foundation Research Institute, the institutional review board for Kaiser Permanente. Our subjects were women in the first trimester of their pregnancies who presented for the intake visit. They were excluded from participation if they were younger than 18 years or older than 39 years of age; had completed 13 weeks of gestation; had a past or current high-risk obstetrical condition; had a current medical condition; were non-English speaking; or were planning to change insurance carriers during the pregnancy. Past high-risk obstetrical conditions were defined

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as preterm delivery, preterm labor, abruptio placentae, severe preeclampsia, classical cesarean delivery (vertical uterine incision), gestational diabetes, incompetent cervix, uterine anomaly, diethylstilbestrol exposure, isoimmunization, more than one second trimester abortion, fetal anomaly, or small-for-gestational-age neonate. Current high-risk obstetrical conditions were multiple gestation (if known at intake), pregnancy conceived through assisted reproductive technology, and large (>4 cm) leiomyomata. Current medical conditions included diabetes, chronic hypertension, drug or alcohol abuse, or any ongoing medical or psychiatric illness requiring treatment or monitoring. Patients without any of these conditions at the time of the intake visit were deemed to be at low risk of adverse events and were offered enrollment. They signed informed consent forms if they agreed to participate in the study. Enrollment began on May 11, 1992, and ended on June 24, 1994. Eligible women declining participation were identified so that analysis of their outcomes could be conducted.

Randomization was accomplished using sealed opaque envelopes that contained assignments to either the experimental or control group. The sequence of assignment was determined using a table of random numbers. At randomization, the patient was informed of her assigned group, and a visit schedule was entered on the chart. Neither subjects nor providers (obstetrician-gynecologists or practitioners [nurse practitioners, physician assistants, or certified nurse midwives]) were blinded to the study hypothesis and randomization status. The experimental schedule consisted of visits at 8, 12, 16, 24, 28, 32, 36, 38, and 40 weeks for a total of nine visits. For parous women, a telephone call was scheduled at 12 weeks instead of a visit. The control (routine) schedule consisted of visits every 4 weeks from 8 to 28 weeks, every 2 weeks until 36 weeks, and weekly thereafter for a total of 14 visits. Since not all women presented exactly at 8 weeks of gestation, we devised an implementation schedule. Women at 7 or 8 weeks were seen according to schedule. Women at 9 or 10 weeks were asked to return at 14 weeks, and also to arrange to have their blood drawn for determination of the maternal serum alpha-fetoprotein level at 16 weeks. Women at 11 or 12 weeks returned for their next visit at 16 weeks. In both groups, ongoing risk assessment occurred at each visit. If risk factors were identified, additional visits to providers or to nurses for fetal monitoring were scheduled as determined by the provider. During the study, consultation for high-risk problems and prenatal diagnosis was provided to all obstetric caregivers by a group of three perinatologists.

Prenatal care was provided by teams composed of obstetrician-gynecologists and practitioners. Visits alternated between physicians and practitioners. The visit lengths and both the educational and diagnostic content were equivalent in each group. Generally, visit lengths were 45 minutes for the intake visit with the practitioners, 15 minutes for return visits with practitioners, and 10 minutes for return visits with physicians. The educational content of each visit was specified on the same sheet as the visit schedule. Topics included those indicated on the standard American College of Obstetricians and Gynecologists forms. Instructions were provided regarding maternal serum alpha-fetoprotein screening, fetal movement in pregnancy, preterm labor, preeclampsia, labor and delivery procedures, anesthesia, breast-feeding, circumcision, and pediatric follow-up. The initial diagnostic content included routine laboratory blood analysis, Papanicolaou test, culture for gonorrhea, and testing for chlamydia. Later tests were maternal serum alpha-fetoprotein screening (offered at 15 through 18 weeks), diabetic screening by 1-hour glucose tolerance test and hematocrit (24 through 28 weeks), and antibody screen (28 weeks for Rh-negative patients). At each return visit, blood pressure, weight, fetal heart rate, and fundal height were measured, and urine was tested for glucose and protein.

We recorded the numbers of visits to (1) physicians or practitioners; (2) nurses for problems occurring between scheduled visits (eg, sore throat, upper respiratory illness, suspected rupture of membranes) or for fetal monitoring; and (3) perinatologists for prenatal diagnosis or consultation outside of the assigned schedules.

The primary outcomes to compare in the experimental and control groups were preterm delivery (<37 weeks), mild and severe preeclampsia, cesarean delivery, and low birth weight (<2500 g). Mild preeclampsia was defined as a blood pressure measurement of 140/90 mm Hg or a blood pressure rise of 30/15 mm Hg over the first trimester levels accompanied by significant proteinuria (>300 mg/24 h) or edema (weight gain, >2.25 kg in 1 week). Criteria for severe preeclampsia were a blood pressure measurement of 160/110 mm Hg, more than 5 g of urinary protein in 24 hours, oliguria, thrombocytopenia, or elevated liver function test findings. Other maternal outcomes assessed were the rates of cesarean delivery for fetal distress, preterm labor, preterm premature rupture of membranes, gestational diabetes, multiple gestation, chorioamnionitis (clinical), abruptio placentae, placenta previa, and postpartum hemorrhage (>750 mL for vaginal delivery and >1500 mL for cesarean delivery). Other neonatal outcomes were gestational age, birth weight, small for gestational age (<10th percentile[16]), very low birth weight (<1500 g), low Apgar score at 5 minutes (<7), and stillbirth (>20 weeks' gestation).

At the 6-week postpartum visit, we assessed patient satisfaction with care and education using a patient-completed written survey to examine differences between patients in the two arms of the study. This voluntary survey was given to the patient at the time of the visit and labeled with her health record number. Items included the woman's opinion of the quality of her prenatal care, of the education provided during prenatal visits, and of the written educational materials provided, the amount of written educational materials, and the adequacy of the number of prenatal visits. Quality of prenatal care was rated on a four-point scale ranging from "excellent" to "poor." Quality of education and education materials were rated on a five-point, Likert-type scale with responses ranging from "extremely satisfied" to "not at all satisfied." The amount of written educational material was rated on a three-point scale, "too much," "just right," or "not enough." The number of prenatal visits was judged to be "too many," "just right," or "too few." After the questionnaires were scored, health record numbers of respondents were linked with their group assignments in the study to identify experimental and control patients.

Statistical Analysis and Power

Prior to the study, the required sample size was calculated based on an anticipated rate of preterm birth of 5.5%. We chose a sample large enough to detect a 2.5% increase in preterm birth over the baseline rate. To achieve 80% power, a total of 2426 participants (1213 in each group) were required.[16] Assuming a 10% spontaneous abortion rate, we adjusted our sample size accordingly to 2669 enrolled women.

Outcome data were abstracted from charts; from computerized databases that include perinatal data, visit data, and laboratory data; and from patient surveys. The data were analyzed using SPSS-PC for Windows, version 6.1. The experimental and control groups were compared using an intent-to-treat analysis. Thus, outcomes of women in the experimental or control group who were

Table 1.—Patient Population in the Prenatal Care Study*

	No. (%)
Total No. of patients seen for new pregnancy	**7333** (100.0)
Patients not eligible to participate in study	3044 (41.5)
Reasons	
Late care (>13 completed wk)	1243
Age (<18 y, ≥40 y)	579
History of high-risk obstetric condition	757
Current high-risk obstetric condition	50
History/current medical condition	222
Planned change to another insurer	42
Abortion	84
Language barrier	67
Low-risk patients eligible to participate in study	4289 (58.5)
Refused to participate	1396
Missed at time of enrollment	129
Enrolled and randomized	2764
Outcome	
Spontaneous abortion	203
Unplanned change to another insurer	183
Elective abortion	21
Patient withdrawal from study	20
Unknown	9
Completed study and analyzed	2328

*Enrollment period, May 11, 1992, to June 24, 1994.

Table 2.—Characteristics of Patients by Study Group (n=2328)

Characteristic	Experimental (n=1165)	Control (n=1163)	P*
Maternal age at enrollment in y, mean±SD	28.5±4.9	28.5±4.8	.86
Race, No. (%)			
White	938 (80.9)	948 (82.1)	.46
Hispanic	140 (12.1)	132 (11.4)	
Black	49 (4.2)	52 (4.5)	
Other	33 (2.8)	22 (1.9)	
Nulliparity, No. (%)	543 (46.6)	587 (50.5)	.06
Years of education completed, mean±SD	14.0±2.2	14.1±2.2	.64
Gestational age at enrollment in wk, mean±SD	8.6±1.7	8.6±1.6	.29

*P value for nulliparity and race was derived from χ^2 analysis. For maternal age, education, and gestational age, analysis was done by t test.

Table 3.—Visit Type Frequency by Study Group

Visit Type	Experimental, No. of Visits, Mean±SD (n=1165)	Control, No. of Visits, Mean±SD (n=1163)	P*
Provider†	10.3±2.8	12.9±2.8	<.001
Nurse	1.2±1.9	1.4±2.2	.04
Perinatology	.46±1.2	.51±1.4	.36
Total No. of visits	12.0±4.2	14.7±4.2	<.001

*Analysis done by t test.
†Obstetrician or practitioner (nurse practitioner, physician assistant, or certified nurse midwife).

seen more frequently than assigned were analyzed according to the initial group assignment. Patients refusing enrollment into the study were compared with the combined study groups. Categorical data were analyzed by the χ^2 test or Fisher's exact test when appropriate; relative risks and 95% confidence intervals were also calculated. Continuous data were compared using the t test. Analyses of overall maternal and neonatal outcomes were one-tailed since the initial hypothesis was that there would be no increase in adverse outcomes. Analyses of demographics, visits, and satisfaction were two-tailed. A P value of <.05 was considered statistically significant.

RESULTS

Of a total of 7333 women evaluated for participation in the study, 3044 (41.5%) were ineligible and 4289 (58.5%) were eligible (Table 1). Of the 3044 ineligible, the main reasons for exclusion were late care (1243 [40.8%]), past high-risk obstetric condition (757 [24.9%]), age (579 [19.0%]), or current medical condition (222 [7.3%]). Of the 4289 eligible women, 1396 (32.5%) refused participation, while 2764 (64.4%) enrolled and were randomized. Of the 2764 enrolled, 2328 (84.2%) completed the protocol and were included in the analysis while 436 women were excluded. Of the latter, the main reasons for exclusion were spontaneous abortion (203 [46.6%]) and unplanned change of insurer during pregnancy (183 [42.0%]). Overall, there were no differences in the numbers of women excluded from analysis in the study groups. Of the 20 women withdrawing from the study, 18 were originally assigned to the experimental group.

As shown in Table 2, there were no differences between the experimental and control groups in age, race, parity, years of education, or gestational age, although there were proportionally more nulliparous women in the control group. The mean gestational age at entry was 8.6 weeks in both groups (SD±1.7 for experimental; SD±1.6 for control). Furthermore, self-reports revealed no significant difference in the prevalence of smoking during pregnancy (experimental, 11.8%; control, 9.7%). However, when the frequency of visits by each group was analyzed (Table 3), important differences were observed. There was a mean of 12.9±2.8 (±SD) visits to providers in the control group compared with a mean of 10.3±2.8 visits in the experimental group (P<.001). The experimental group also had significantly fewer nurse visits than the control group. Overall, women in the experimental group had 2.7 fewer total visits per pregnancy than those in the control group (P<.001).

There were no significant differences between the two study groups in any maternal outcome (Table 4). Preterm delivery occurred in 6.3% of the experimental group and 5.4% of the control group (P=.19). Delivery prior to 32 weeks occurred at rates of 0.9% and 0.7%, respectively (P=.32). The rates of mild and severe preeclampsia were not different. Cesarean delivery was performed in 13.0% of the experimental group and 12.0% of the control group (P=.25). Further, there was no difference between the two study groups in cesarean delivery due to fetal distress.

There were no differences in neonatal outcomes measured (Table 5). Mean birth weights were not different. The rates of low birth weight were 5.4% in the experimental group and 6.1% in the control group (P=.76). The rates of neonates who were small for gestational age were 3.1% and 2.4%, respectively (P=.16). Stillbirths occurred infrequently during the study period.

Because of the presence of more nulliparous women in the control group, we tested the effect of parity on numbers of visits and on maternal and neonatal outcomes. Using two-way analysis of variance (ANOVA) with study group and parity as the main effects, we found no differential effect of nulliparity on the total number of visits in the two study groups. Further, when we compared maternal and neonatal outcomes, there were no differences with the exception of proportionally more cases of abruption in the experimental group (P=.04).

Of the 1396 women who declined participation in the study, 1165 would have been eligible for inclusion in the analysis of the study. Reviewing their records, we found that the mean number (±SD) of their visits to providers was 12.8±3.1, and the mean number of total visits was 14.9±4.6. These numbers of visits were not significantly different from those of the control group. There were no differences between the combined study groups and the group who refused en-

Table 4.—Maternal Outcomes by Study Group

Outcome Variable	Experimental, No. (%) (n=1165)	Control, No. (%) (n=1163)	Relative Risk (95% Confidence Interval)	P*
Preterm delivery, wk				
<37	73 (6.3)	63 (5.4)	1.08 (0.92-1.27)	.19
<32	10 (0.9)	8 (0.7)	1.11 (0.73-1.68)	.32
Preeclampsia				
Mild	59 (5.1)	66 (5.7)	0.94 (0.78-1.14)	.74
Severe	10 (0.9)	9 (0.8)	1.05 (0.68-1.62)	.41
Cesarean delivery				
Overall	151 (13.0)	140 (12.0)	1.04 (0.93-1.17)	.25
Fetal distress	23 (2.0)	26 (2.2)	0.94 (0.69-1.27)	.67
Preterm labor	79 (6.8)	77 (6.6)	1.01 (0.86-1.18)	.44
Preterm PROM†	38 (3.3)	38 (3.3)	1.00 (0.80-1.25)	.50
Gestational diabetes	18 (1.5)	18 (1.5)	1.00 (0.72-1.39)	.50
Multiple gestation	10 (0.9)	12 (1.0)	0.91 (0.57-1.43)	.67
Chorioamnionitis	9 (0.8)	11 (0.9)	0.90 (0.55-1.46)	.68
Placenta previa	7 (0.6)	9 (0.8)	0.87 (0.50-1.52)	.70
Abruptio placentae	17 (1.5)	11 (0.9)	1.21 (0.90-1.64)	.13
Postpartum hemorrhage				
Vaginal delivery	32 (3.2)	33 (3.2)	0.98 (0.77-1.27)	.47
Cesarean delivery‡	2 (1.3)	3 (2.2)	0.77 (0.26-2.27)	.77

*Analysis done by χ^2 test.
†PROM indicates premature rupture of membranes.
‡Analysis done by Fisher's exact test.

Table 5.—Neonatal Outcomes by Study Group

Outcome	Experimental, No. (%) (n=1175)*	Control, No. (%) (n=1176)	Relative Risk (95% Confidence Interval)	P
Low birth weight†	64 (5.4)	72 (6.1)	0.94 (0.78-1.12)	.76‡
Very low birth weight†	7 (0.3)	6 (0.3)	1.08 (0.65-1.79)	.39
Small for gestational age	36 (3.1)	28 (2.4)	1.13 (0.91-1.41)	.16
Stillbirth	5 (0.4)	5 (0.4)	1.00 (0.54-1.86)	.50
Apgar score at 5 min, <7	18 (1.6)	29 (2.5)	0.77 (0.53-1.10)	.95
Gestational age, wk, mean±SD	39.2±1.9	39.2±1.9		.99§
Birth weight, g, mean±SD	3286±520	3295±536		.66

*Number of births at >20 weeks' gestation.
†Low birth weight is defined as <2500 g and very low birth weight is defined as <1500 g.
‡Analysis done by χ^2 test.
§Analysis done by *t* test.

Table 6.—Patient Satisfaction With Prenatal Care by Study Group

Satisfaction Measure	Experimental, No. (%) (n=589)	Control, No. (%) (n=600)	P*
Quality of prenatal care as excellent or good	574 (97.5)	587 (97.8)	.67
Quality of education during prenatal visits as extremely or very satisfied	526 (89.6)	544 (91.4)	.29
Quality of written educational materials as extremely or very satisfied	519 (88.6)	528 (88.7)	.93
Amount of written educational materials as just right	476 (85.3)	496 (87.2)	.60
No. of prenatal visits			
Too few	49 (8.8)	6 (1.1)	
Just right	494 (89.2)	473 (82.8)	.002†
Too many	11 (2.0)	92 (16.1)	

*Analysis done by *t*-test.
†The χ^2 test was done comparing proportions of women in each study group, rating the number of visits as "just right" with the combined categories of "too few" or "too many."

rollment in patient characteristics or maternal or neonatal outcomes, with the exceptions of parity and preterm delivery (<37 weeks). There were significantly more nulliparas in the nonparticipating population than in the combined study groups (63.0% vs 48.5%, $P<.001$). Preterm delivery occurred in 7.6% of the nonparticipating population and 5.8% of the combined study groups ($P=.05$). A multiple logistic regression analysis was done to determine whether differences in preterm delivery between these two groups existed when controlling for differences in parity. In this analysis, there was no significant difference in the preterm delivery rate between those who refused to participate and the combined study groups after controlling for the higher rate of nulliparity in the refused group.

The satisfaction survey was completed by 589 women in the experimental group and 600 in the control group, about one half of the total study population. Although the proportion of returned questionnaires was low overall (51.1%), there was no difference in the proportions of returns in the two groups. In addition, we compared selected demographic variables and perinatal outcomes of respondents to nonrespondents. There were no differences in rates of nulliparity, preterm delivery, cesarean delivery, or low birth weight between responders and nonresponders. There were more cases of preeclampsia among the nonresponders ($P=.011$). Items pertaining to satisfaction with prenatal care, education, written educational materials, and the number of visits were dichotomized for the analysis. Overall, no differences in responses were found regarding the quality of prenatal care, education, written educational materials, or the amount of educational materials received (Table 6). It was interesting to learn that significantly more patients in the experimental group rated their number of visits as "just right" compared with the control group. Of the experimental group, 2.0% of respondents rated their number of visits as "too many" compared with 16.1% of the control group. Conversely, in the experimental group, 8.8% of respondents said there were "too few" visits compared with 1.1% in the control group.

COMMENT

In this randomized controlled trial, we found no significant differences between those obtaining care in a routine schedule of visits and those in our lower-frequency experimental group, following the recommendations of the Expert Panel on the Content of Prenatal Care, for any maternal or neonatal outcome in a population of low-risk women. With significantly fewer prenatal visits, equivalent perinatal outcomes were maintained. We chose end points for the study that might be affected by the number of prenatal care visits, namely, preterm birth, preeclampsia, cesarean delivery, and low birth weight. We also looked at the frequency of occurrence of other maternal problems including gestational diabetes, preterm premature rupture of membranes, and abruptio placentae, which might affect neonatal health status. Based on posttrial analysis, our sample size had 80% power to detect a 2% absolute increase in the rates of preterm birth and low birth weight, considered by the investigators to be the most important outcomes potentially affected by the number of prenatal visits. However, we recognize that an enormous sample size would be required to

detect a significant increase in low frequency outcomes such as very low birth weight or stillbirth or to detect small increases (1%) in the rates of the principal outcomes.

We were concerned initially that there were proportionally more preterm births in the experimental group (6.3%) than in the control group (5.4%). Because of the recognized variation in gestational age determination, we felt it was relevant to see whether there were also more cases of low birth weight (a more reliably measured variable) in the experimental group. When we then examined the rates of low birth weight we observed that there were proportionally more low-birth-weight neonates in the control (6.1%) than the experimental (5.4%) group. Therefore, our concern was lessened. None of the differences, however, were significant.

We observed that there were more provider visits in the experimental group than predicted (10.3 vs 9.0). However, the model proposed by the expert panel did not consider additional visits for identified risk, intercurrent illness, or patient demand for prenatal services. We speculate that the observed increase in visits in the experimental group might have been due to these factors.

In the postnatal survey, we learned that respondents were very satisfied with the prenatal care they received. There were no differences in the two groups in the percentage of patients rating their care as good or excellent. Significantly more women in the experimental group stated that they had the right number of visits compared with the control group. While these results are encouraging, we acknowledge that nearly half of the patients did not return their surveys.

For over two decades, there has been interest in the relationship of prenatal care to perinatal outcome. Observational studies of mothers receiving adequate prenatal care have demonstrated fewer preterm births,[3] higher birth weights,[2,3,8] fewer low-birth-weight and very low-birth-weight neonates,[1,4,6,9] and fewer stillbirths and neonatal deaths[1,5,7] compared with mothers receiving inadequate prenatal care. While these studies have supported the general concept of prenatal care, there has been little evidence to determine whether a "dose-response" relationship exists for prenatal visits and perinatal outcome for low-risk women. Binstock and Wolde-Tsadik[18] conducted a small clinical trial using the expert panel recommendations for low-risk women. Although randomization was not strict and women requiring additional visits for high-risk conditions were excluded, they observed 3.1 fewer prenatal visits (11.3 vs 8.2) in the study group compared with the control group, and the two groups had equivalent perinatal outcome.

In the current study we have demonstrated that both perinatal outcome and patient satisfaction are maintained when low-risk pregnant women undergo the prenatal visit schedule suggested by the Expert Panel on the Content of Prenatal Care. Because we found no differences in the outcomes of participants and nonparticipants, we believe the results can be generalized to our population of low-risk women, which is largely white and reasonably well educated. However, the results of this study may not be generalizable to other populations whose demographic characteristics differ. If these results are replicated in other populations, we theorize that the use of this schedule will lower the cost of delivery of prenatal care to low-risk women, without in any way adding to perinatal problems. Although the mean visit difference of 2.7 observed in this study may not seem striking initially, we speculate that the savings in direct medical costs for the estimated 2 million low-risk pregnant women receiving care each year in the United States would be considerable. When indirect medical costs (eg, work absence, travel time, and child care) are considered, the societal benefits of the expert panel's guideline are even greater.

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