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Effects of Continuous Intrapartum Professional Support on Childbirth Outcomes

Ellen D. Hodnett and Richard W. Osborn

The purpose of this stratified randomized trial was to determine the physical and psychological effects of continuous, one-to-one professional support on childbirth outcomes. Data were gathered during prenatal and postpartum interviews with, and from the medical records of, 103 low-risk women. All subjects had attended one of two types of prenatal education programs, were accompanied by husbands or partners during labor, and had vaginal deliveries. Subjects in the experimental group were less likely to have medication for pain relief and less likely to have episiotomies. Three variables were found to predict perceived control during childbirth—expectations of control, the presence of a continuous professional caregiver, and pain medication usage. The results demonstrate the importance of the traditional nursing support role during childbirth.

The paucity of well-controlled clinical trials concerning the management of normal childbirth means that little definitive information is available concerning the effects of various obstetrical interventions or birth settings for the 85% of North American women who are considered low in obstetrical risk (Chalmers, 1983; Committee on Assessing Alternative Birth Settings, 1982; Ontario Ministry of Health, 1987). Some attention has been paid to the question of the optimum place of birth for low-risk women, including the design (e.g., homelike vs. hospital-like) or location (hospital, birth center, or home). More important than the setting per se may be specific attributes of the setting. A review of the literature indicated that two environmental variables—social and professional support—and three personal variables—anxiety, expectations of personal control, and commitment to unmedicated birth—may influence the outcomes of normal pregnancies.

Environmental Variables

Two randomized trials in Guatemala found that intrapartum social support by a lay companion decreased labor length and the incidence of perinatal complications (Klaus, Kennell, Robertson, & Sosa, 1986; Sosa, Kennell, Klaus, Robertson, & Urrutia, 1980). However, the results cannot be generalized to North American birth environments, because routine intrapartum practices are very different in the two cultures. On the one hand, practices that are standard in North America but not in Guatemala include the presence of the husband or significant other, as well as interventions such as electronic fetal heart monitoring, continuous epidural anesthesia, and intrapartum oxytocics. On the other hand, in Guatemala "the combination of crowded hospital conditions, the absence of prenatal preparatory classes, and the unfamiliar hospital environment may have markedly increased maternal

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anxiety and exaggerated the effect of the supportive companion" (Sosa et al., 1980).

No reports of randomized trials were found in which the effects of intrapartum professional support were tested, although in one study the intrapartum caregiver-patient relationship was linked to mothers' initial reactions to their newborns (Newton & Newton, 1962), and in a case-control study women who hired birth attendants experienced greater personal control during childbirth than those who did not (Hutton, 1985). Furthermore, clinical observations suggest that supportive care by a nurse or midwife can affect labor processes. For example, in an institution in which active management of labor is the policy and in which firm limits are set on labor length, the highly favorable outcomes (including a 5% cesarean section rate) have been related to the beneficial effects of continuous one-to-one support by a midwife during labor (O'Driscoll & Meagher, 1986).

Personal Variables

Trait and/or state anxiety during pregnancy has been associated with intrapartum complications (Crandon, 1979; Erickson, 1976), uterine efficiency during labor (Lederman, Lederman, Work, & McCann, 1979), prolonged labor (Beck et al., 1980; Hodnett & Abel, 1986; Lederman, Lederman, Work, & McCann, 1978), and Apgar scores (Lederman, Lederman, Work, & McCann, 1981).

The expectation of some degree of personal control during childbirth has been identified as common to parturient women (Davenport-Slack & Boylan, 1974; Humenick & Bugen, 1981; Rich, 1973), and expected control has been shown to be inversely related to prenatal anxiety (Hodnett & Simmons-Tropea, 1987). In decision-making research on Lamaze-trained women, prenatally assessed values concerning giving birth without analgesia or anesthesia were shown to be unrelated to intrapartum desires but strongly related to postpartum values (Christensen-Szalanski, 1984); the authors suggested that caregivers who wish to promote long-term satisfaction with childbirth may be advised to attend more to prenatal expectations than to transient, impulse-driven desires during labor.

A model of person-environment interaction may explain some childbirth outcomes. However, while there is a general consensus that psychological as well as physical outcomes should be measured in studies that attempt to evaluate aspects of birth settings (Committee on Assessing Alternative Birth Settings, 1982; Oakley, 1983), the selection of a suitable psychological outcome is complicated by problems of measurement. "Satisfaction with childbirth" is an amorphous, multidimensional outcome for which no valid, reliable tool was available. However, experienced personal control or mastery has been found to be a key component of birth satisfaction (Butani & Hodnett, 1980; Humenick & Bugen, 1981), has been linked to other birth outcomes (Butani & Hodnett, 1980; Davenport-Slack & Boylan, 1974; Hodnett, 1980; Hodnett & Simmons-Tropea, 1987; Hott, 1980), and is easily measured with reliable instrumentation (Hodnett & Simmons-Tropea, 1987).

The purpose of this study was to examine the physical and psychological effects of intrapartum professional support, alone and in combination with key antenatal attributes, on a sample of low-risk women in a North American hospital. The design was a stratified randomized trial.

METHOD

Sample

A total of 145 subjects were enrolled in the study. All were attending one of two types of prenatal education programs, Lamaze or "General." The former emphasized breathing and relaxation techniques intended to reduce the need for pain relief medication during labor, while the latter placed greater emphasis on information about hospital routines and newborn care. Stratification of the sample made it possible to examine the influence of choice of prenatal education on outcomes.

Because the purpose was to study those women who continued to have uncomplicated pregnancies and ultimately had vaginal births, data from 42 women were dropped from most of the analyses. The most common reason for subject attrition was cesarean section (13 control and 12 experimental), for an overall cesarean section rate of 17.3%. Six experimental and 2 control subjects withdrew from the study, on three occasions a caregiver was unable to be with a subject either prenatally or intrapartally, 1 experimental subject delivered precipitously elsewhere, and 5 subjects (4 controls, 1 experimental) developed complications late in the third trimester. When all major prenatal variables (anxiety, expectations, demographics) were considered, there were no significant differences between those who were retained in the final sample and those who withdrew or were eliminated (Hodnett & Osborn, 1987).

The final sample consisted of 103 women—49 experimental subjects (27 in the General pro-

gram and 22 in the Lamaze) and 54 control subjects (29 in the General program and 25 in the Lamaze)—who had uncomplicated pregnancies, were accompanied by husbands or partners during labor, and had vaginal deliveries of healthy newborns. The sample was predominantly Caucasian, middle class, married, and primigravid. Only 11% reported annual family incomes less than $24,000, all but 1 were high school graduates, and half had at least a baccalaureate education. All but 6 of the women were employed outside the home, and their mean age was 29.8 (SD = 3.65, range 20–39).

The setting was a Toronto, Canada, teaching hospital serving a predominantly low-risk obstetrical population, with an annual census of approximately 2,400 births. In nurse-patient staffing ratios (the staffing pattern was based on a 1:1-2 nurse-patient ratio during active labor) and routine intrapartum practices, it was comparable to other area hospitals.

Measures

Three psychological variables—anxiety, control, and commitment to unmedicated birth—were measured with established instruments. Anxiety was measured by the State-Trait Anxiety Inventory (Spielberger, 1983), Forms Y2 (trait anxiety) and Y1 (state anxiety). In order to assess anxiety in the third trimester of pregnancy, the instructions to Form Y1 were modified, as in previous investigations (Gorsuch & Key, 1974; Hodnett & Abel, 1986). Subjects were asked to complete the Y1 scale according to how they had been feeling for the previous two weeks. The Y1 and Y2 scales have received extensive psychometric and field testing (Spielberger, 1983). In this trial, Cronbach's alpha reliability coefficients of .93 (Y1) and .91 (Y2) were obtained.

Expected and experienced personal control during labor were measured by the Labour Agentry Scale (LAS), a 29-item summated rating scale (Hodnett & Simmons-Tropea, 1987). Cronbach's alpha coefficients for the LAS in previous studies ranged from .91 to .98, while factor analysis determined that the LAS was unifactorial (Hodnett & Simmons-Tropea, 1987). The Cronbach's alpha coefficients obtained for the LAS in this trial were .92 for the antepartum version and .95 for the postpartum version.

An instrument based on the utility theory of decision making was used to assess the subject's intentions regarding usage of pain relief medication during childbirth (Christensen-Szalanski, 1984). The tool, which we named the Commitment to Unmedicated Birth (CUB) instrument, consists of two items in which the linear analogue score for "desire to avoid hard labor pains" is subtracted from the score for "desire to give birth without using pain relief medication" (Christensen-Szalanski, 1984).

Data that were extracted from the subjects' medical records included: (a) usage of intrapartum pain relief medication; (b) incidence of intrapartum obstetrical interventions (a category that included oxytocics, episiotomy, forceps, and amniotomy); and (c) labor length. To ensure reliability in abstraction of medical record data, duplicate abstraction was done by a second research assistant, blind to the subjects' study group assignment, on a random sample of 20 records. Interrater agreement of over 95% was obtained for all categories of interventions and physical outcomes.

Procedure

Following approvals by a human subjects review committee at the University and by the participating hospital, subjects were recruited and consents obtained during the last trimester of pregnancy, at the time of the second prenatal class. To avoid any implication that "experimental" was "better," the potential subjects were told that two methods of care were being studied: Method A consisted of additional prenatal and postpartum support, while Method B consisted of additional prenatal and intrapartum support.

The experimental intervention consisted of continuous intrapartum professional support by a familiar caregiver. Professional support was conceptualized as involving four dimensions: (a) emotional support, e.g., encouragement, reassurance, continuous physical presence; (b) informational support, e.g., instructions, explanations, and advice; (c) tangible support, e.g., physical comfort measures such as massage, cool compresses, ice chips; and (d) advocacy, such as interpreting the couple's wishes to hospital staff, and acting on their behalf.

The 8 caregivers who provided the experimental intervention were self-employed birth attendants, or "labor coaches," who had provided continuous intrapartum support to a minimum of 20 couples during hospital labors. All 8 were lay midwives or in training to become midwives. Group meetings with the project director and principal investigator prior to and during the data collection period served as checks that all caregivers were providing similar types of support. An additional measure to ensure consistency and reliability of the experimental maneuver involved ongoing postbirth discussions

between the caregivers and the project director. Substantive evidence of the consistency and quality of support offered by the caregivers was provided by another postpartum instrument, described elsewhere (Hodnett & Osborn, in press).

The first prenatal interview was conducted at approximately 33 weeks gestation. The purpose of the interview was to obtain baseline data about demographic characteristics, anxiety levels, and personal expectations of control during childbirth. Subjects completed the Y1, Y2, and LAS.

Subsequent to this interview a third party, who had no knowledge of the couple other than the type of prenatal education program they were attending, made the assignment to an experimental or control group by consulting one of two tables of random numbers, depending on whether the subject was in the Lamaze or General program.

Each experimental couple met with their assigned caregiver to establish a relationship and to enable the caregiver to ascertain the couple's needs, desires, and expectations concerning the upcoming labor. As a control for the possible influence of additional prenatal attention to the experimental couples, two comparable prenatal meetings between each control couple and a member of the project staff took place, at which information and counseling were provided as needed.

The second prenatal interview was conducted at 38-39 weeks gestation. In addition to answering questions about her specific childbirth expectations, each subject completed the Y1 and LAS (to determine if study group assignment had influenced subjects' anxiety and expected control) and the CUB.

When labor began, each experimental couple notified their caregiver, who provided continuous support during early labor at home and throughout the hospital labor until 1 hour postpartum. In all other respects the control and experimental subjects received routine intrapartum care by nursing and medical staff.

The postpartum interview was conducted by an interviewer who was blind to the subject's group assignment. It took place in the subject's home 2 to 4 weeks after the birth. Data collection included readministration of the LAS, to assess the subject's experienced control during childbirth, as well as a semistructured interview covering multiple aspects of the birth experience.

Data Analysis. The level of statistical significance was set at $p < .05$. Because of the size of the data set and the complexity of the study, several statistical procedures were employed. Contingency tables containing categorical independent and dependent measures were tested for statistical significance using Chi Square or Fisher's Exact tests. Students' *t*-tests were employed to determine if experimental and control subjects differed in mean labor length variables. Repeated measures analysis of variance was used to detect differences within the four study groups in anxiety and control.

After Pearson correlations for all interval-level variables were obtained, stepwise multiple regression analysis was conducted to determine which combination of antepartum and intrapartum variables formed the best model predicting experienced control. Variables entered into the regression procedure included presence of the experimental maneuver, type of prenatal education, expected control at prenatal interviews 1 or 2, trait or third-trimester anxiety, commitment to unmedicated birth, and intrapartum analgesia/anesthesia. Categorical variables were transformed into dummy variables for the regression procedures. The following criteria were employed to determine the best model: the model accounted for the largest amount of the variance in experienced control, and each independent variable in the model explained a significant amount of the variance.

RESULTS

Prenatal Psychological Variables

A summary of mean scores of the prenatal psychological variables in each of the four groups is presented in Table 1. Analyses of variance of the scores of the four study groups indicated that the randomization process was successful, in that assignment to experimental or control groups did not account for significant amounts of the variance in any of the prenatal psychological variables. However, choice of prenatal education program did differentiate between groups on two variables—expected control (as measured prior to study group assignment) and commitment to unmedicated birth—with Lamaze attenders having higher mean scores on both.

Intrapartum Analgesia/Anesthesia

The category of analgesia/anesthesia included all who had epidural anesthesia and/or intramuscular analgesia at any time during first or second stage labor. Of the 74 subjects in this category, 66 (89%) had continuous epidural anesthesia (with or without prior I.M. analgesia), while the remaining 12 had intramuscular analgesia and/or terminal epidural anesthesia.

Table 1. Summary of Scores on Prenatal Psychological Variables

	Experimental				Control			
	General		Lamaze		General		Lamaze	
	M	(*SD*)	*M*	(*SD*)	*M*	(*SD*)	M	(*SD*)
				Prenatal Interview 1				
Y2[a]	35.0	(8.8)	32.3	(7.4)	36.8	(8.9)	33.2	(7.9)
Y1[b]	38.9	(11.4)	38.6	(9.1)	36.9	(9.5)	36.6	(10.7)
LAS[c]	139.8	(24.8)	152.5	(20.1)	141.5	(23.1)	149.4	(23.2)
				Prenatal Interview 2				
Y1[b]	31.3	(14.8)	36.6	(10.9)	34.5	(9.8)	32.4	(10.9)
LAS[c]	148.6	(19.9)	157.6	(19.8)	154.8	(23.8)	155.0	(22.1)
CUB[d]	18.5	(48.6)	55.2	(29.7)	13.5	(42.6)	39.7	(40.7)

[a]Trait anxiety. [b]Third trimester anxiety. [c]Labour Agentry Scale (expected control). [d]Commitment to unmedicated birth.

Experimental subjects were significantly more likely to labor and give birth without any analgesia or anesthesia (see Table 2). Students' *t*-tests of the mean scores of those who did and did not use medication for pain relief indicated there were nonsignificant differences in the group mean scores on the major prenatal variables (commitment to unmedicated birth, anxiety, and expected control).

Other Intrapartum Interventions

The cesarean section rate of the 72 women who were originally enrolled as experimental subjects was 17% ($n = 12$), not significantly different from the 18% rate ($n = 13$) among the 73 corresponding control subjects. The rates of intrapartum interventions experienced by the final sample of 103 control and experimental subjects are listed in Table 3. Experimental subjects were less likely to have episiotomies or to be placed in stirrups for delivery. However, when the categories of oxytocic induction and augmentation of labor were combined, it was found that experimental subjects were more likely to have intrapartum oxytocics: 21/49 vs. 12/54, $\chi^2(1, N = 103) = 4.12$, $p = .04$.

There were no significant differences in numbers or types of perineal lacerations. The number of intact perineums (defined as no episiotomy nor laceration greater than first degree) was significantly higher in the experimental group, 16 vs. 6, $\chi^2(1, N = 103) = 5.87$, $p < .02$. Of the 31 forceps deliveries, all but 5 (3 control and 2 experimental) were mid-forcep; in nearly all instances, the medical records indicated that the reason for forcep delivery was second-stage labor length greater than 2 hours and/or some evidence of fetal distress.

Table 2. Differences Between Experimental and Control Groups in Utilization of Pain Relief Medication

Group	Medication for Pain Relief[a] No	Yes
Experimental		
Lamarze	11	11
General	8	19
Control		
Lamaze	7	18
General	3	26

$\chi^2(3, N = 103) = 9.8$, $p<.02$. [a]analgesia and/or anesthesia.

Labor Length

Students' *t*-tests of labor length variables revealed nonsignificant differences between experimental and control groups, and all Pearson correlations between antenatal variables and labor length variables (latent phase, active phase, and total labor length) were also nonsignificant. Of the subgroup of 28 women who had no intrapartum medication (neither analgesia, anesthesia, nor oxytocics), 19 were experimental subjects and 9 were controls. There were no significant differences in any labor length variables—latent phase, active phase, first stage, second stage, total labor length or length of time from admission to delivery—between the experimental and control subjects in this small subgroup. For example, mean first stage labor length was 8.5 hrs., $SD = 4.1$, for the 9 control subjects and 8.9 hrs, $SD = 4.1$, for the 19 experimental subjects, $t(26) = -.23$, $p = .82$.

Table 3. Comparisons of Intrapartum Interventions Experienced by Experimental and Control Subjects

	Group					
	Experimental (n = 49)		Control (n = 54)			
Intervention	n	(%)	n	(%)	χ^2	p
Episiotomy	30	61	46	85	6.44	<.01
Stirrups	23	47	38	70	4.91	.02
Forceps	13	27	18	33	.29	NS
EFHM[a]	34	69	44	81	1.44	NS
Oxytocic induction	5	10	1	2	(Fisher's[b])	NS
Oxytocic augmentation	16	33	11	20	2.19	NS
Amniotomy	21	43	30	56	1.19	NS
Enema	4	8	6	11	.03	NS
Perineal shave	0	0	0	0	—	—

[a]Electronic fetal heart monitoring. [b]Fisher's exact test, two-tailed.

Confounding Influences of Intrapartum Medication

For 75 of the subjects, confounding variables were present in the form of intrapartum oxytocics and/or analgesics and/or anesthetics: 1 had only oxytocics, 42 had only pain relief medication, and 32 had oxytocics plus pain relief medication. These 75 subjects had significantly longer labors (M = 17.1, SD = 8.96) than the 28 who had no pharmacologic interventions (M = 9.86, SD = 3.94), $t(99.57) = 5.69$, $p < .0001$.

When the data from the 33 women who had oxytocics were removed from the analyses, other differences in labor length and intervention rates emerged. The labor length of those who had pain relief medication (M = 14.9 hrs., SD = 8.2) was significantly greater than those who did not (M = 9.5 hrs., SD = 3.6), $t(60.75) = 3.77$, $p = .0004$. Nineteen in the experimental group (68%) compared to 9 in the control group (21%) labored and gave birth without analgesia or anesthesia, $\chi^2(1, N = 70) = 13.22$, $p < .0003$. Four experimental subjects had forceps deliveries, compared to 15 controls (two-tailed Fisher's exact test, $p < .06$), and 11 experimental subjects did not have electronic fetal heart monitoring, compared to 6 controls, $\chi^2(1, N = 70) = 4.43$, $p < .04$.

Predictors of Experienced Control

The mean postpartum LAS scores of the four study groups were as follows: General Control M = 147.6, SD = 33.2; Lamaze Control M = 148.7, SD = 31.3; General Experimental M = 151.3, SD = 26.4; Lamaze Experimental M = 166.3, SD = 26.9. A repeated measures ANOVA, to test the influence of prenatal education, time of administration of the LAS (prenatal and postpartum), and continuous professional support on experienced control, indicated that the only significant influences were time, $F(2,198) = 6.03$, $p = .003$, and an interaction effect between time and continuous support, $F(2,198) = 3.27$, $p < .04$.

Pearson correlations of all antenatal and postpartum variables are presented in Table 4, and the results of the stepwise multiple regression analysis are found in Table 5. In the total sample, the combination of expected control at the first prenatal interview and the experimental subjects who had no medication during labor accounted for 30% of the variance in experienced control. In the subgroup of 28 who had unmedicated births, a similar model (adding trait anxiety) explained 61% of the variance.

DISCUSSION

There were obvious differences between the findings of the two Guatemalan studies (Klaus et al., 1986; Sosa et al., 1980) and this study in a North American setting. The high intrapartum intervention rates in the Toronto hospital, particularly, the rates of oxytocics and epidural anesthesia, interfered with efforts to examine effects of the experimental maneuver on labor length. Only 8 subjects (6 experimental and 2 control) labored and gave birth without interventions of any kind (neither intravenous oxytocics, intravenous fluids, continuous electronic fetal monitoring, amniotomy, forceps, nor episiotomy). Nonetheless, the Toronto findings do indicate that continuous professional support during labor can improve maternal out-

Table 4. Correlation Matrix of Antenatal Psychological Variables, Labor Length Variables, and Experienced Control

	Y1A[b]	Y2[c]	Y1B[d]	CUB[e]	LAS2[f]	LAS3[g]	*F*stage[h]	Total[i]
LAS1[a]	−.46*	−.35*	−.12	.34*	.71*	.41*	−.10	−.09
Y1A[b]		.59*	.36*	.02	−.43*	−.20*	.35*	.37*
Y2[c]			.29*	.01	−.45*	−.27*	−.04	−.02
Y1B[d]				.11	−.43*	−.19	−.07	−.08
CUB[e]					.28*	−.27*	−.05	−.07
LAS2[f]						.26*	.08	.08
LAS3[g]							−.05	−.07
*F*stage[h]								.99*

[a]Expected control at first prenatal interview. [b]Third trimester anxiety at first prenatal interview. [c]Trait anxiety. [d]Third trimester anxiety at second prenatal interview. [e]Commitment to unmedicated birth. [f]Expected control at second prenatal interview. [g]Experienced control. [h]First stage labor length. [i]Total labor length. * Significant at .05 level or better (two-tailed).

comes, even in a sample of women who, by virtue of their sociodemographic characteristics, prenatal education, and obstetrical risk status, are already most likely to have low levels of physical and psychosocial morbidity resulting from childbirth.

The data provided no ready explanation for the increased incidence of oxytocics in the experimental group. It may be that efforts to restrict the analysis to women who were low in risk until the onset of labor were not sufficiently rigorous. It was not possible to clearly delineate between elective and indicated induction in this study, since the reasons given for induction fell into the "gray" area in which there is debate concerning the benefits and risks of conservative versus interventive management.

Continuous supportive care had no evident direct effect on labor length. Women who had continuous supportive care were less likely to need pain relief medication; in turn, subjects who did not have any intrapartum medication had shorter labors and higher levels of perceived control. However, the category of "medication usage" included oxytocics as well as analgesia and anesthesia. The separate effects of each could not be definitively determined, although there were indications that pain relief medication and oxytocics were both associated with prolonged labor. These interrelationships of labor length, pharmacologic pain relief, and experiences of control have also been found in other studies (Butani & Hodnett, 1980; Hodnett, 1980; Hodnett & Simmons-Tropea, 1987; Hott, 1980; Humenick & Bugen, 1981; Hutton, 1985; Pilkington, 1987). Although the design problems will be considerable, it will be important to rigorously explore these relationships in future prospective studies.

The findings provide partial support for a model of person-environment interaction during childbirth. Type of prenatal education, anxiety (trait

Table 5. Results of Stepwise Multiple Regression Analyses of Predictors of Experienced Control Scores

Variable Entered	*b*	*SE*	R^2 at End of Step	Test of Significant R^2 Change *F*	*p*
	Total Sample (N = 103)				
Expected control[a]	.487	.108	.164	23.369	<.0001
Support/no drugs[b]	.368	6.505	.299	19.192	<.0001
	Subset Who Had No Intrapartum Medication (n = 28)				
Expected control[a]	.458	.158	.346	21.517	.0001
Support[c]	.394	6.884	.531	11.325	.0026
Trait anxiety	−.341	.504	.612	5.068	.0338

[a]Scores at first prenatal interview. [b]a Dummy variable describing those experimental subjects who had no intrapartum medication. [c]A dummy variable for continuous intrapartum professional support (the experimental condition).

or state), and commitment to unmedicated birth had little impact on outcomes. In general, the important predictor variables were the experimental maneuver—continuous professional support—and expectations of personal control.

The study should be replicated on other samples in other settings. The question as to whether or not continuous professional support during labor is economically viable should be addressed by a comprehensive cost-effectiveness evaluation that considers whether the expense associated with one-to-one support is offset by savings associated with lower physical and psychosocial morbidity, decreased need for personnel skilled in maintaining continuous epidural anesthesia, shorter hospital stay, fewer nurses on duty during "off-peak" periods, etc. In the interim, consideration should be given to improving the professional support currently offered to laboring women and their partners. Such improvements may not involve adding to the complement of nursing staff so much as a rethinking of nursing priorities in labor and delivery suites.

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