

## Prenatal House Calls for High-Risk Pregnancies?

Brooten D, Youngblut JM, Brown L, et al. A randomized trial of nurse specialist home care for women with high-risk pregnancies: outcomes and costs. *Am J Manag Care* 2001;7:793-803.

### Study Overview

**Objective.** To determine whether delivering a portion of the prenatal care to women with high-risk pregnancies at home by nurse specialists improves pregnancy outcomes and reduces cost.

**Design.** Unblinded, randomized controlled trial.

**Setting and participants.** 173 women with gestational or pregestational diabetes mellitus, chronic hypertension, and preterm labor or at high risk for preterm labor were recruited from a potentially eligible population of 188 women. Women at high risk for preterm labor were defined as those with uterine fibroids, previous preterm labor, multiple pregnancy, or a score of at least 10 on a modified Creasy screening tool. All participants were patients seen at the Hospital of the University of Pennsylvania in Philadelphia. Of the 188 women considered for the study, 9 were excluded and 6 declined. The exclusion criteria were not described. Most of the study subjects were African American and had public health insurance.

**Intervention.** Both groups had the same number of prenatal and postpartum visits scheduled. In the intervention group, half of the visits were scheduled to take place in the patients' homes with advanced practice nurses and with physician backup by telephone. The remaining visits were scheduled to occur in the clinic with physicians. Home and clinic visits alternated every other visit. Participants in the control group had all their visits scheduled with physicians in the clinic.

**Main outcome measures.** The primary study endpoints were not specified. Multiple maternal and fetal outcomes were reported, including fetal, neonatal, and infant death; gestational age; birth weight; delivery hospitalization length of stay (LOS); rehospitalizations and their LOS; acute care visits; and several outcomes for the twin gestations. The mean and total charges for different components of care and for overall care for premature infants were reported. Patient satisfaction and maternal affect were also assessed using questionnaires.

**Main results.** Total fetal and infant mortality was significantly

higher in the control group (9/98 versus 2/94), but 2 of the control group deaths were due to spontaneous abortions. There was no statistically significant difference in the number of preterm infants between groups (29 in the intervention group versus 40 in the control). Savings (\$2,880,000) for the intervention group were reported, but the evidence to support a statistically significant difference in charges is absent. Among subjects in the intervention group with twin gestations, there were fewer preterm births. There was no difference in maternal affect between groups, and satisfaction was higher in the intervention group although the difference was not given.

**Conclusion.** The authors conclude that providing half of the prenatal care for women with high-risk pregnancies using home visits from advanced care nurses produces beneficial health and financial outcomes.

### Commentary

On the surface, this article appears to use a strong study design (the randomized controlled trial) to demonstrate that an intervention produced better outcomes than the usual care with which it was compared. Unfortunately, there are 3 major reasons why the authors' conclusions should be questioned. First, the primary study endpoints were not defined beforehand. As a result, the reader is left asking if the outcomes chosen for discussion were selected after the fact, once the comparisons that would yield positive findings were known. Second, the abstract summarizing the article highlights differences in the rates of preterm infants and monetary charges between the groups, but the study results do not demonstrate that these differences are significant. Lastly, incorrect methods are used in the financial analysis. Once again, no prespecified endpoints are given. The total charges for the pregnancies resulting in preterm infants were quite different (\$1,685,823 for the intervention group versus \$4,181,968 in the control group), but the costs for the full-term infants (58 control and 65 intervention) cases were not reported. We are not told the total charges of the entire groups. Only 1 of 10 statistical comparisons they chose to make achieved statistical significance. To make matters worse, a *t* test was used to compare the means of charges and LOS. Financial charges and LOS as expected

are not normally distributed here, meaning that by chance a few unevenly placed statistical outliers can excessively influence the totals or means for the charges and LOS. To account for data of this kind, it would have been appropriate to report median charges and LOS and to use the Wilcoxon rank-sum or another nonparametric test to determine significance. It is not possible to judge from this article if differences in charges or LOS were merely due to chance.

### **Applications for Clinical Practice**

Frequently, physicians and health care decision makers must assess new evidence to inform decisions they make for their patients or health care systems. This article was chosen to demonstrate the caution needed as one approaches an article appearing in the peer-reviewed literature that concludes that a new practice should be adopted. The abstracted findings of an article may overstate a study's results, and inap-

propriate methods may be used in order to support the favored hypothesis. Caution is especially important in a case such as this one where prior studies have not consistently been able to show that interventions influencing the intensity of prenatal monitoring affect premature birth [1]. While advanced practice nurses making home visits may be a valuable addition to the care of women with high-risk pregnancies, this article by Brooten et al does not help elucidate the issue. Rather, it challenges us to heighten our awareness as we read the medical literature.

*– Review by Stephen D. Persell, MD*

### **References**

1. Dyson DC, Danbe KH, Bamber JA, et al. Monitoring women at risk for preterm labor. *N Engl J Med* 1998;338:15-9.

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