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Life Around Newborn Discharge (LAND)

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Life Around Newborn Discharge (LAND) – Executive Summary

The newborn period is one of biologic and social transition that provides an important opportunity for the health care system to identify and respond to acute and chronic health conditions, as well as social problems facing families.^{1,2} As lengths of hospital stays and postpartum services have been reduced, in-hospital opportunities to screen for medical and social risks have diminished. Moreover, it is unclear to what extent decisions about discharge reflect financial pressures rather than mutual agreement between physicians and mothers about the appropriateness of the time of discharge.

If factors other than maternal and infant readiness for discharge affect its timing, then adverse outcomes might be anticipated. Recent studies on the potential effects of decreased lengths of postpartum hospital stays have been inconclusive.³⁻¹⁰ We hypothesize several reasons why this may be so. First, while the neonatal period accounts for two-thirds of infant mortality during year one,¹¹ most infants and mothers are generally healthy. Second, some mothers and families feel well educated in perinatal care, have adequate support, and are prepared for the arrival of an infant. For these select mothers, discharge from the hospital earlier than that which is conventionally recommended can be successful and indeed may offer advantages. Third, desirable redundancies may exist in the systems and resources available to care for newborns and families, including inpatient postpartum care, pediatric offices and clinics, home visits by nurses, and family resources (such as extended family). Fourth, there is little information on the proportion of mothers and infants who may be perceived as unready for discharge and how these perceptions may put the pair at risk after postpartum discharge.

To address these gaps in knowledge, the Life Around Newborn Discharge (LAND) Study was designed to examine mothers', pediatricians', and obstetricians' judgments of readiness for postpartum discharge. It identifies the components of practitioner judgment or family readiness for discharge and then relates these judgments to health care utilization, health-related behaviors, and infant and maternal health status during the first month of the infant's life. This is done in the context of comparing the supplemental services, postpartum supports, and family adjustments perceived as necessary by mothers, pediatricians, and obstetricians with those that are actually delivered.

Research Questions:

The study had the following research questions:

1. How often do mothers, pediatricians, and obstetricians agree on readiness for postpartum discharge?
2. What influences these perceptions of readiness?
3. How do these perceptions impact health care utilization, health outcomes, and health-related behaviors in the four weeks after postpartum discharge?
4. How do these perceptions change during the four weeks after nursery discharge?

Study Design and Methods

We conducted a prospective, observational cohort study in the US. The total enrollment for this study, 4329 mothers and their newborns, ended last month. Since the study enrollment period was extended to increase the total sample size, including minority, underserved, and disadvantaged populations, we are only able to present preliminary data for the first 2370 dyads in this report. The dyads for this study were drawn from a geographically diverse national sample of pediatric primary care practitioners in an established and experienced practice-based research network. We utilized the Pediatric Research in Office Settings (PROS) network of the American Academy of Pediatrics (AAP), particularly those PROS practices that have a high proportion of minority patients, enhancing the representation of minority, underserved, and disadvantaged populations in this study. The obstetric perspective was obtained in parallel with the pediatric and maternal perspectives on the day of discharge from the hospital. The large number of practicing practitioners, the collective research and practice experience in the network, the successful use of similar methods in prior research and pilot efforts, and the ability to gather both parent and practitioner reports provided a unique opportunity for the PROS network to conduct this investigation.

Findings

We are presenting preliminary results on approximately 55% of the total cohort. On the day of nursery discharge, while 91% of mothers felt it was the “right day” for their infant’s discharge, only 87% of them felt it was the “right day” for their own discharge. Reasons given for not being the “right day” included needing more medical care for either the mother or infant, the infant was not feeding well, or the mother was too tired or not comfortable taking the infant home yet. Ninety-six percent of pediatric practitioners felt the chosen day was the “right day” for discharge of either the mother or infant. An equal percentage of obstetricians also felt that the chosen day was the “right day” for the mother to be discharged. Mothers whose education was less than high school were less likely to be ready for discharge, as defined as a joint classification of “ready” by the mother, pediatrician, and obstetrician. Minority mothers and those with prenatal or neonatal problems were less likely to be ready.

Recommendations

Our findings support the recommendations of the Secretary of Health and Human Services’ Advisory Committee on Infant Mortality (SACIM) preliminary reports to Congress.^{12, 13} SACIM recommends broadening the focus of concern beyond the issue of length of stay to the multiple important factors affecting maternal and infant health. This defines the goal of postnatal and postpartum services to achieve optimal newborn and maternal health in the short and long-term, and to ensure the delivery of health care after leaving the hospital, regardless of length of stay.¹³

Our study indicates a need for increased maternal support both at newborn discharge as well as during the postpartum period. We anticipate that our further in-depth investigations into influential predictors of readiness will provide earlier insight in determining the appropriateness for discharge and ambulatory follow-up. Continued exploration of discharge decision-making

may also provide better guidelines for the types and extent of postpartum services necessary to be delivered to mother/infant pairs in an individualized fashion.

List of Products

Peer-reviewed Articles

1. Britton J, Baker A, Spino C, Bernstein HH. Postpartum Discharge Preferences of Pediatricians: Results From a National Survey. *Pediatrics* 2002;110:53-60. (Appendix A)
2. Bernstein HH, Spino C, Baker A, Slora E, Touloukian C, McCormick M. Postpartum Discharge: Do Varying Perceptions of Readiness Impact Health Outcomes? *Ambulatory Pediatrics* 2002;2:388-95. (Appendix B)

Abstracts

1. Bernstein H, Homer C, Baker A, Bocian A, Spino C, McCormick M. The First Two Weeks After Postpartum Discharge: Issues Facing Mothers. APA 1998 [Abstract 299] Poster presentation, *Arch of Pediatr Adolesc Med* 1998: 107. (Appendix C)
2. Bernstein H, Spino C, Baker AE, Slora EJ, Homer C, McCormick M. Readiness for Postpartum Nursery Discharge: Do Varying Perceptions Make a Difference? [Abstract 179] Slide presentation, APA May 1999: 74. (Appendix D)
3. Baker A, Spino C, Slora E, Britton J, Bernstein H. Newborn Hospital Discharge Practices of Pediatricians: Results From a National Survey. [Abstract 1103] Poster presentation *Ped Res* April 2001;49:194A. (Appendix E)

Reviews, Chapters, and Editorials

1. Arnold S, Bernstein HH. Newborn Discharge: A Time To Be Especially Thoughtful. *Contemporary Pediatrics*. 2000;17(10):47-69. (Appendix F)
2. Arnold S, Bernstein HH. When should newborns be discharged? *Contemporary OB/GYN* 2000;45 (11):47-69. (Appendix G)

Presentations

1. Bernstein HH. Primary Care Perspectives at Scientific Summit on the Optimal Timing of Hospital Discharge of Mothers and Neonates. "Beyond the Fourth Dimension: Assuring Quality Health Care for Mothers and Babies." Maternal and Child Health Bureau. June, 1996.
2. Bernstein HH. Secretary's Advisory Committee On Infant Mortality. "Early Postpartum Discharge: Evidence and Recommendations." Maternal and Child Health Bureau. June, 2001.

Introduction

Insurers, managed care companies, and hospitals operating under capitation have sought to reduce costs through initiatives to shorten hospital stays, including the length of postpartum hospitalizations for mothers and newborns. Between 1970 and 1992, the average length of stay for all deliveries decreased from 4.1 to 2.4 days.¹⁴ Health care practitioners, families, and public officials raised concern about medical, behavioral, and emotional consequences of shortened postpartum length of stay. In response to public perceptions that pressure to shorten postpartum stays had become excessive, a majority of states enacted legislation mandating insurance coverage for a minimum length of postpartum stay when requested by mother or the attending physician. In a report of four New Jersey hospitals, the average postpartum length of stay for uncomplicated deliveries increased by 10-12 hours in the six months after enactment of such state legislation.¹⁵ The Newborns' and Mothers' Health Protection Act of 1996 was then passed to establish federal requirements for minimum hospital length of stay following birth for both mother and infant.

The immediate postpartum period is one of biological and social transition. Because virtually all births in the United States occur under close medical supervision, this transition period historically provides an important opportunity for the health care system to identify and respond to both acute and chronic health and social problems facing families.^{1,2} As lengths of hospital stays and services were reduced, opportunities to screen for medical and social risk diminished.

Traditionally, practitioners have judged the degree of readiness and risk and determined suitable timing for discharge. The components of this judgment about discharge timing are complex and probably include intuitive assessments of biological and social risk, barriers to access, adequacy of education and postpartum services, and, admittedly, tradition. Economically inspired, rule-based decision making may limit good judgment and result in unsuitable discharge timing and insufficient postpartum services for some mothers and infants. Much of the concern about changes in insurance coverage for postpartum discharge arises not only from the specific medical issues entailed in the transition to family life but from concern about loss of control of medical decision making under new systems of "managed care."^{16, 17} This loss of control translates into diminished ability for practitioners to exercise judgment about the timing of discharge and necessary post-discharge services and to ensure that mothers feel ready to go home. The intent of The Newborns' and Mothers' Health Protection Act of 1996 was to return the decision-making process for the timing of discharge back to the practitioners and families. It is clear that this act *alone* will not achieve the goal of optimal mother/infant health. In the absence of an adequate base of scientific knowledge about what is most effective and efficient to achieve the best health outcomes, it appears rational and ethical to be guided by a combination of good judgment, caution, and compassion in weighing the best evidence available.¹⁸

The LAND Study had the following specific primary aims:

1. Describe readiness of mother and newborn for postpartum hospital discharge based upon maternal, pediatric, and obstetrical perceptions and clinical judgments, and explore determinants of readiness. We hypothesize that mothers will be less likely to see either their infants or themselves as ready for discharge, and pediatricians and obstetricians will be

more likely to judge timing for discharge unsuitable for infant and mother as biologic and social vulnerabilities increase, anticipated postpartum support and services are less available, prenatal/in-hospital education is less adequate, maternal experience is limited, specific maternal perinatal health concerns are raised, the decision regarding length of stay is constrained, and specific practitioner/practice characteristics are considered.

2. Examine the relationship among maternal, pediatric, and obstetrical perceptions, clinical judgments of mother and infant readiness for postpartum hospital discharge, and the subsequent health care utilization, health-related behaviors, and infant and maternal health status during the first four weeks after discharge. We hypothesize that when mothers or practitioners perceive that the mother or infant is not ready for discharge, decreased maternal and infant health status, adverse health-related behaviors, and increased rates of health care use during the first four weeks after discharge will result.

Additionally, we had the following three secondary aims:

1. Measure concordance among maternal, pediatric, and obstetrical perceptions and clinical judgments of mother and infant readiness at the time of postpartum hospital discharge, and determine how well this concordance predicts maternal and infant health status, health-related behaviors, and health care use during the first four weeks after discharge.
2. Distinguish any subsequent change in maternal and pediatric perceptions and clinical judgments of mother/infant readiness between the time of postpartum hospital discharge and four weeks after discharge, and explore characteristics of those individuals who change their perceptions.
3. Obtain more specific, exploratory descriptive data on the issues facing mothers in the first two weeks after discharge.

Review of the Literature

Beyond speculation and anecdotal reports, what concrete information does the scientific literature provide? Unfortunately, current research fails to offer definitive answers regarding the safety of "early" discharge or the efficacy of prolonged hospital stays.^{17, 19-21} We practice in an era of evidence-based medicine, yet financial implications have a far-reaching impact on clinical practice, when clear scientific justification is lacking.

Current studies are fraught with methodological and design flaws. Many are retrospective and lack the sample size needed to generate statistical power. Selection bias resulting from strict eligibility criteria, lack of randomization, or voluntary enrollment in early discharge programs by low-risk women is a frequent criticism.

Furthermore, interventions that are effective in a controlled setting do not always work in the community. Research that focuses on a homogeneous population, for example, is difficult to generalize to multiple socioeconomic groups in different geographic locations. The lack of a comparison group, insufficient follow-up intervals and follow-up data, and a limited range of measured outcomes are other common pitfalls. The definition of early discharge is variable and

has changed over time, which makes comparisons between studies difficult. What is defined as early in one study is late in another.

The most frequently studied study measures of adverse effects of newborn discharge have drawbacks, which undermine their validity.

Measure	Drawback	References
Rehospitalization of newborns	<ul style="list-style-type: none"> • Needs large sample size to detect significant results • Varies geographically among institutions and physicians • Reason for rehospitalization may not reflect timing of discharge • Conflicting data 	5-7, 9, 10, 17, 22-25
Neonatal mortality	<ul style="list-style-type: none"> • To date, no association found 	9, 22
Outpatient follow-up (telephone, office visit, urgent care, or home visit)	<ul style="list-style-type: none"> • No information about the quantity or quality of visits needed 	19

For limited nursery stays to succeed, reliable follow-up is imperative. Current knowledge about newborn physiology and disease processes suggests that a clinical evaluation no later than postpartum day 3 to 4 is needed, regardless of the time of discharge. As previously mentioned, however, present federal guidelines and legislative efforts do not provide details concerning the quantity or quality of postpartum discharge services. Who should provide the care (nurse, physician, or a midlevel provider), for example? What type of follow-up should occur (visit or telephone call)? Where should it occur (home, office, or clinic)? When should it occur? How often and for whom should the services be provided? How can we ensure follow-up for indigent populations with high "no-show" rates, particularly for families with access issues and limited support at home?

Unfortunately, answers to these burning questions are not readily found in the literature. Although a plethora of studies have examined a variety of postpartum programs that provide care after discharge, little information currently exists to help guide routine follow-up.^{26, 27} Most of the available studies are small, with voluntary enrollment and limited generalizability to community practice. More research is needed to lend scientific justification to refining follow-up guidelines.

Study Design and Methods

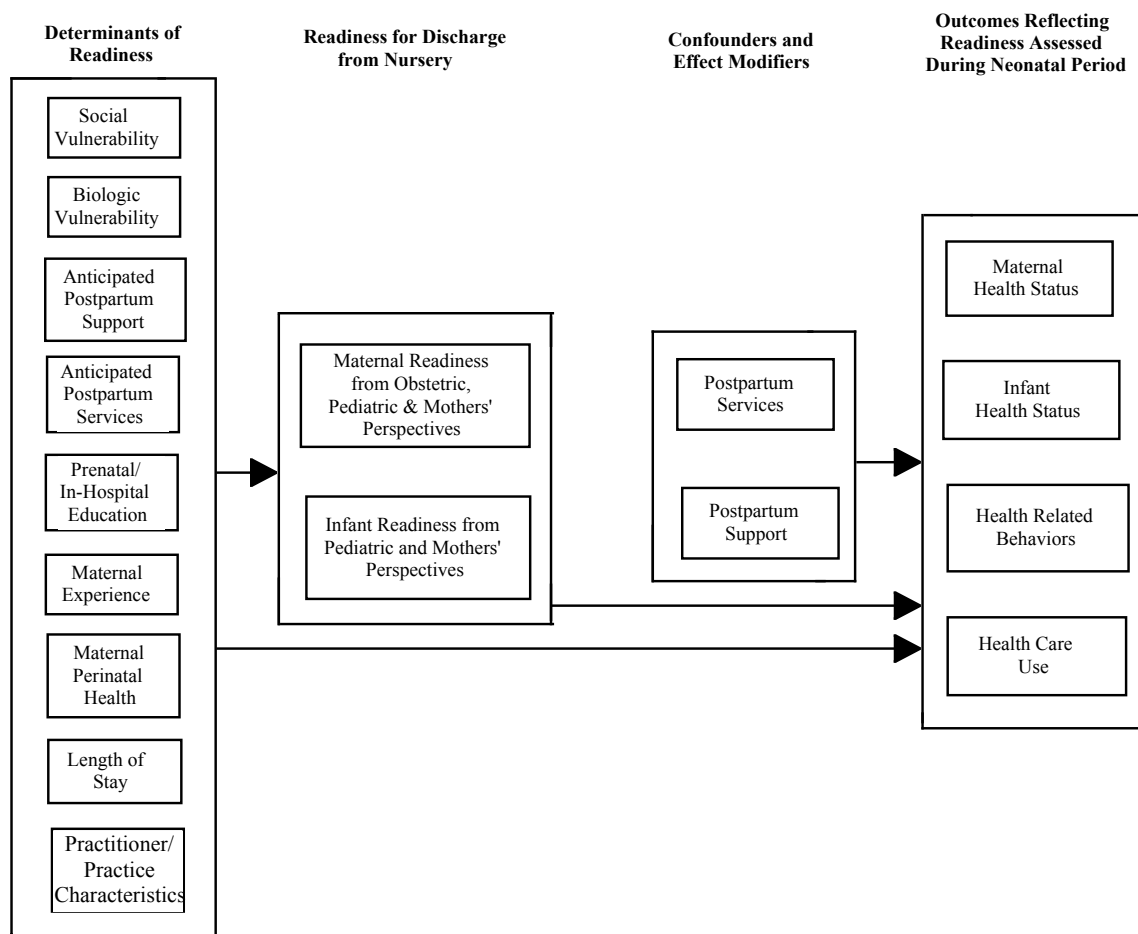
The decision making for discharge readiness is complex and includes biologic and social factors, educational needs, maternal experience and health, and support systems with some provision for comprehensive, accessible health care. Infants and families are best served when the services

they receive are matched to their needs. A trained practitioner working together with the family is the best judge of how to achieve that match.¹⁷ Different characteristics of the mother, her environment, and the services available to her determine that level of need. Various characteristics of the health care environment may constrain the choices available to meet her needs. Good judgment and available data do not tell us where services should ideally be performed, by whom, and with exactly what content or methods.¹⁸

The timing of postpartum discharge reflects the match (or mismatch) between needs and services. Discharge when the new family is not medically or psychosocially ready will place the new family unit at risk. Post-discharge services may be put in place to modify this risk, which will be exhibited through an elevated likelihood of adverse outcomes (e.g., poor maternal or infant health status, increased use of health services as a result of this decreased health status, or adoption of health-related behaviors disadvantageous to maternal and infant health).

Given this backdrop, there are four domains in the conceptual model that serve as the basis for the LAND Study: 1) **determinants of readiness** - factors that are hypothesized to affect judgments of readiness for discharge as well as the health outcomes under study; 2) **readiness for discharge from nursery** - the key construct at the core of the study, it includes the perspective of those involved in the discharge decision-making process - mothers, obstetricians, and the pediatric providers; 3) **confounder and effect modifiers** - factors including postpartum medical services and postpartum social supports, particularly as they retrospectively affect perceived maternal and infant readiness for discharge; and 4) **outcomes reflecting readiness assessed during the neonatal period** - dimensions that allow some insight as to whether the assessments of readiness at the time of discharge hold and the direct impact of these assessments.

Conceptual Model



Land Pilot Study

The LAND Pilot Study was fielded in the late winter of 1997, just prior to the federal legislation of the Newborns' and Mothers' Health Protection Act (see details in Appendix B) went into effect. It was undertaken to assess viability of study procedures, estimate participation rates, determine likely missing data rates for participants, and refine the protocol and data collection instruments. The pilot was also intended to yield preliminary information on the newborn discharge decision and how that decision affects health care utilization, health-related behaviors, and infant and maternal health status.

Thirteen PROS practices were asked to recruit all eligible mother/infant dyads for births occurring during a designated seven-day period. Mothers who consented to participate were given an enrollment packet. This included a Mother's Enrollment Questionnaire (to be completed on the day of discharge), a Mother's Daily Diary (to be completed for 14 consecutive days, beginning the first day the infant was at home), and a Mother's Follow-up Questionnaire (to be completed on the infant's one-month birthday). Practitioners completed a Practitioner Initial Questionnaire (to be completed on the day of discharge by the practitioner who examined the infant in the nursery), a Practitioner Encounter Questionnaire (to be completed by the treating practitioner each time the infant was seen in the practice during the month following discharge),

and a Practitioner Follow-up Questionnaire (to be completed on the infant's one-month birthday through chart review and treating practitioner input).

The results showed substantial variation in the mothers' and pediatricians' perceptions of readiness for postpartum discharge on the day of discharge and over time. The perceptions were significantly associated with maternal and infant health status, health-related behaviors, and health-care utilization. The study also found considerable morbidity during the first two weeks after postpartum discharge.

National Survey of Pediatrician Postpartum Discharge Preferences

To identify practice/physician characteristics that influence pediatricians' self-reported newborn discharge practices, pediatricians identified through the American Academy of Pediatrics as those who routinely provide care for newborns in the nursery rated on the periodic survey the importance of 22 infant, maternal, and peripartum factors in determining readiness for nursery discharge (Appendix H). They also reported their perceptions of optimal and minimal length of stay for healthy term newborns. Importance of readiness factors was dichotomized as "high" (very important or important) versus "low" (neither, unimportant, or very unimportant). Relationships between pediatricians' responses and demographic information were explored using multivariate logistic regression (see "Presentation of Findings" below and other details in Appendix A).

Specific Study Design

PROS practices serve approximately 2.5 million of the nation's children, with approximately equal numbers of males and females. Eligible newborns included those with an estimated gestational age of 37 weeks or more by obstetric dates, a birth weight of five pounds or more, and who were seen for continuing ambulatory pediatric primary care in a participating PROS practice. Excluded were newborns whose mothers: 1) had a chronic illness (e.g., hypertension, diabetes); 2) had present pregnancies resulting in multiple deliveries; or 3) lacked telephone accessibility. Also excluded were newborns: 1) who were admitted to the special care nursery for more than eight hours; 2) who were identified with a major congenital disorder during the nursery stay; 3) who were expected to be adopted; or 4) whose parents felt they were unable to complete the study materials.

Each practice enrolled all eligible newborns seen consecutively for visits in the hospital nursery during a period of eight weeks, or until up to 60 pairs were enrolled (1% of targeted maximum sample size). Mothers, pediatricians, and obstetricians answered questionnaires at the time of enrollment (Appendix I, J, and K). Mothers completed daily diaries for the infant's first two weeks at home, and practitioners completed an encounter questionnaire at each pediatric office encounter during the first four weeks after discharge (Appendix L and M). Mothers and pediatricians each completed follow-up surveys at four weeks after discharge (Appendix N and O). Each mother then completed a postcard at 7-8 weeks postpartum, documenting the date of her obstetrical checkup. Participating practices received \$30.00 per mother/infant dyad to help offset their practice's staff efforts for the study. By the final year of enrollment, we had learned that recruiting practitioners who see large numbers of minority patients requires more time and money than with non-minority practices. Hence, we requested and received additional funds (\$75 per enrolled pair) from the AAP to include a number of practices serving higher proportions of

minorities, by increasing their incentive to participate to \$105 per mother/infant dyad. As recruitment incentives, families received upon enrollment a one-piece newborn undergarment with the study logo and, upon study completion, a book on parenting.

Instruments

The nine self-administered questionnaires, refined by use in the pilot study, were then used in the main LAND study. This process entailed working with a specialist to analyze the reading level of the maternal instruments in order to reduce the instructions and questions to a 4th-6th grade reading level. In addition, team members and consultants reviewed each questionnaire for content and consistency within and between instruments and for cultural sensitivity. The materials were translated into universal-dialect Spanish at a 4th-6th grade reading level. The Practice Demographic Questionnaire and a Practitioner Survey were completed by physicians prior to beginning mother/infant enrollment (Appendix P and Q). The purpose of these instruments was to glean practice demographic information and to explore routine newborn discharge attitudes and habits.

Statistical Techniques Employed to Analyze (First 2370 Cases)

Summary statistics (mean \pm standard deviation, minimum, and maximum) were calculated for all continuous study variables of interest. Frequencies and percents were calculated for all discrete variables of interest. Chi-square or Fisher's exact tests for categorical data and two-sample t-tests or Wilcoxon tests for continuous data were used to compare characteristics between those mother/infant dyads perceived as "ready" by the mother, obstetrician, and pediatric practitioner and those perceived as "not ready." Characteristics examined were those indicated in our conceptual model. Complete-case methods of analysis (i.e., no imputation methods for missing data) were used. Due to time constraints, multivariate analyses have not been conducted to date.

Kappa statistics (agreement corrected for chance) and raw agreement rates were used to assess agreement of readiness for discharge between mothers and practitioners at the time of discharge and at one-month follow-up.

Planned Statistical Analyses for Full Study Sample (Total 4329 Cases)

Given that outcomes for mothers and infants seen in the same practice will be more closely related to each other than to those in other practices, the generalized estimating equation approach to cluster data will be used. We will assume an exchangeable correlation structure within each practice and effectively increase the standard errors of the parameter estimates to reflect the reduced amount of "independent" information. This approach will be used whether bivariate and multivariate analyses are linear, logistic or Poisson.

An additional concern with the generalizability of study results comes from the method of obtaining data: we relied on volunteer practices from the PROS network. This potential source of bias cannot be accounted for easily in analyses, since outcome data for non-participant practitioners were obviously not available. However, we will compare the demographic characteristics, attitudes, and reported behaviors (with respect to newborn and maternal discharge) of the practitioners who participated in the study with that random sample of practitioners in the broader membership of the AAP (see National Survey of Pediatrician Postpartum Discharge Preferences above). If we find that the sample of practitioners in our

study is not representative of the national population, then we will use weighted regression methods to estimate outcomes that are more representative of practitioners in general. The weights will be derived by comparing the study sample to the membership of the AAP.

For each study aim, analyses will begin descriptively with graphs and summary statistics (mean and standard deviation, median and interquartile range, or portion and confidence interval, as appropriate) for variables of interest. This will allow us to further refine important variables, such as readiness for discharge and maternal diary outcomes. This will be done for the entire cohort of mother/infant pairs, as well as stratified by the judged readiness for discharge, and by other determinants of readiness and potential confounders and effect modifiers. Through this process, we hope to illustrate overall patterns of these outcomes for the various subgroups defined by the needs and services described in the conceptual model.

More formally, relationships will be explored using regression models, adjusted for correlation within practice as described above. For continuous end points, such as SF-12 scores of days of breastfeeding, we will use linear regression; for binary endpoints, such as breastfeeding at four weeks after discharge or maternal hospitalization, we will use logistic regression; and for count data, such as the number of practitioner visits, we will use Poisson regression.

To assess concordance among the various perceptions of readiness, raw agreement rates and chance-adjusted Kappa statistics will be computed. If there is substantial disagreement, then McNemar's tests will be used to see if mothers more often (or less often) feel unready for discharge than their practitioners.

Presentation of findings

Full Study Cohort (n = 4329)

Maternal Participation Rates for the Full Study Cohort. Analysis of practice logs indicates that 4329 of 4999 eligible mother/infant dyads (87%) were successfully enrolled in this study during the period September 20, 1999 and August 28, 2002. Of the 114 participant practices, 49 practices did not record any patients as being missed. The reasons reported for maternal nonparticipation included maternal refusal (n=331), provider unable to approach (n=125), and miscellaneous other (n=214).

Questionnaire Response Rates for the Full Study Cohort. The response rates reported are based upon the full study cohort, but are not complete because data entry has not been completed for the most recent enrollees in the trial. At the time of this report, study questionnaires were returned at a high rate for both maternal and pediatric practitioner instruments, ranging from 93% for the Practitioner Initial Questionnaire to 59% for the Mother's Follow-Up Questionnaire. Among the initial questionnaires, the lowest participation rate was observed for the Obstetrical Questionnaire (response rate = 64%).

Minority Sampling and Practice Characteristics. Our operational definition of a minority was one who is either non-white and/or Hispanic. By these criteria, at least 33% of our study subjects were minorities (See Table 1). This is based on data from the Practitioner Initial Questionnaire. Some "Unknown" subjects will be more specifically classified once the

race/ethnicity data from the Mother's Enrollment Questionnaire is included. The 114 practices enrolling the first 4329 cases were well distributed geographically (see PROS map in Appendix R).

Preliminary Scope of Results (n = 2370)

We are presenting preliminary results on approximately 55% of the total cohort. These results should be considered preliminary until confirmed by analyses on the full study cohort. Practice characteristics were diverse in organization and setting (see Table 2).

National Survey of Pediatrician Postpartum Discharge Preferences

The periodic survey showed that female pediatricians reported a more biopsychosocial approach to determining discharge readiness than their male counterparts, taking into account infant characteristics, maternal skills, and socioemotional issues that may affect the mother-infant pair's adjustment at home. The finding that those who provide care for the most financially vulnerable patients do not see the need for longer LOS is both surprising and of concern. The results support the need for a prospective critical examination of perinatal hospital discharge practices, such as this PROS LAND Study (see published article in Appendix A).

The results of the AAP's periodic survey exhibited comparable results to the Practitioner Survey in the LAND study, making the LAND results generalizable to the general pediatric population.

Mother and infant characteristics

The characteristics of the mothers and infants are listed in Table 3. Mothers ranged in age from 14 to 46 years and 59% have had other children, 16% of whom reported difficulties with prior neonates. Fourteen percent of our participants did not have a high school diploma.

Readiness for discharge

On the day of nursery discharge, while 91% of mothers felt it was the "right day" for their infant's discharge, only 87% of them felt it was the "right day" for their own discharge. Reasons given for not being the "right day" included needing more medical care for either the mother or infant, the infant was not feeding well, or the mother was too tired or not comfortable taking the infant home yet. More than 1/3 reported that their insurance company told them how long they could stay in the hospital after the baby was born. Ninety-six percent of pediatric practitioners felt the chosen day was the "right day" for discharge of either the mother or infant. The physician/mother agreement was 94% at the time of discharge. The majority of obstetricians (96%) felt that it was the "right day" for the mother's discharge on the day of nursery discharge (see Tables 4 - 6).

The mean length of stay was 1.7 days for vaginal deliveries and 3.0 days for deliveries by C-section. Sixty-eight percent of dyads left the hospital within 48 hours. A majority of pediatricians recommended follow-up appointments (98%) at the time of nursery discharge, in 8.8 days for office visits and in 3.2 days for home care visits on average. For those patients who were recommended home care visits, 59% of them were within 48 hours. The relationships between follow-up plans and short length of stay (< 48 hours), maternal age less than or equal to 18 years, maternal education less than high school graduate, type of delivery, minority status, and primigravid status were analyzed using Chi-squared tests. Dyads with a shorter length of

stay were more likely to have either an office or home care visit within 3 days ($p=0.03$), driven by differences in the timing of home care visits. Mothers delivering by C-section were less likely to have early office visits compared to mothers with vaginal deliveries (e.g., 27% of mothers with C-sections had an office visit within 4 days compared to 34% of mothers delivering vaginally, $p=0.01$). First-time mothers were more likely to have earlier office or home care visits (e.g., 26% of first-time mothers had an office or home care visit within 2 days compared to 18% of mothers of multiple births, $p<0.0001$). Other variables were not statistically significantly associated with follow-up plans (see Tables 7-11).

Actual health care utilization for the baby as determined by the number of visits made in the office, home, and emergency department settings reported by the mother four weeks after nursery discharge are presented in Tables 12 and 13. Ninety-seven percent of the infants had medical visits during the first four weeks after nursery discharge; of these 1,567 infants, an average of 1.9 visits to the doctor's office were made.

Factors associated with readiness for discharge

Of the 1,197 mother/infant pairs with complete data on readiness at the time of nursery discharge, 22% were classified as *unready* by either the mother, obstetrician, or pediatric practitioner (see Table 14). The following factors were significant predictors for lack of readiness ($p<0.05$):

- Mom's race not white
- Mom minority (where minority is defined as non-white or Hispanic)
- Mom's ethnicity Hispanic or Latino
- C-section delivery
- Longer length of labor
- Birth in the hospital (vs. hospital birthing center)
- Neonatal problems in the hospital
- Biological vulnerability
- Prolonged labor
- **Not** visited by pediatrician in hospital
- Mom's ability is **not** the same as other moms
- Dad's ability is **not** the same as other dads
- Dad's knowledge is **not** the same as other dads
- Older pediatric practitioners
- Public insurance or uninsured (vs. private insurance)

Other determinants or outcomes of readiness indicated in our conceptualization were not statistically significantly related with readiness in this preliminary initial dataset.

Sixty-two percent of the mothers reported that additional services would have helped them feel more confident in caring for their babies during the first four postpartum weeks (see Table 15). More help at home, more patient education while in the hospital, and some or more home visits were reported by at least 20% of mothers.

Concordance in maternal, pediatric practitioner and obstetrician assessment of readiness

On the day of discharge, the percent agreement among mothers, pediatric practitioners, and obstetricians about readiness for discharge of the mother/infant pair was 78%. Considering only the mother/infant dyad, 94% of mothers and pediatric practitioners agreed about the dyad's readiness for discharge on the day of nursery discharge. This agreement fell to 76% when mothers and pediatric practitioners assessed readiness four weeks after discharge.

Consistency in assessments of readiness over time

There was also poor agreement between the mother's assessment at the time of discharge and one month post-discharge (see Table 16). Thirteen percent of mothers felt that the dyad was not ready for discharge on the day of discharge, but this number increased to 20% four weeks later. Practitioners were more consistent in their assessments of readiness for discharge at the two time points.

Postpartum outcomes

As reported in the two weeks of daily diaries, information about health care utilization and concerns for mother and infant are in Table 17. Mothers had an average of 2.2 days of concern about their infants' feeding, 0.7 days of concern about their breathing, 1.2 days of concern about their sleeping, 1.2 days of GI concerns, 1.2 days of jaundice concerns, and 0.8 days of other concerns or worries. They made an average of 2.0 phone calls and 2.0 medical visits for their infants. Personally, mothers reported an average of 1.8 days of pain, 1.0 days of bleeding, 1.3 days of feeling sad, 1.5 days of breast concerns, 0.8 days of incision concerns, and 0.8 days of other concerns for themselves. They made an average of 1.0 phone calls and 0.5 medical visits for themselves.

Discussion of Findings

Traditionally, practitioners have determined suitable timing for discharge, judging the degree of readiness and risk. The components of this judgment about discharge timing are complex and include intuitive assessments of biological and social risk, barriers to access, adequacy of education and postpartum services, and, admittedly, tradition. Economically inspired, rule-based decision making may limit good judgment and result in unsuitable discharge timing and insufficient postpartum services for some mothers and infants. The preliminary results present a complex picture both of initial assessments of readiness and subsequent assessments that may need to be considered in policy development. We will be able to characterize the consequences in terms of morbidity and health care use of readiness and unreadiness to help refine approaches to these policies.

Much of the concern about changes in insurance coverage for postpartum discharge arises not only from the specific medical issues entailed in the transition to family life but from concern about loss of control of medical decision making under new systems of "managed care."^{16,17} This loss of control translates into diminished ability for practitioners to exercise judgment about the timing of discharge and necessary post-discharge services, and to ensure that mothers feel ready to go home. In the absence of an adequate base of scientific knowledge about what is most effective and efficient to achieve the best health outcomes, it appears rational and ethical to be guided by a combination of good judgment, caution, and compassion in weighing the best

evidence available.¹⁸ The intent of The Newborns' and Mothers' Health Protection Act of 1996 was to return the decision-making process for the timing of discharge back to the practitioners and family, implying that agreement between the perceptions of both parties is critical to the postpartum hospital discharge decision.

Difficulties in obtaining the full complement of minority subjects arose because, unfortunately, our original partnering relationship with a not-for-profit organization dedicated to "improving the health and longevity of minority populations" was dissolved after year 1. That money was subsequently used, in part, to shore up project shortfalls (e.g., unexpectedly high project material assembly costs) and to support the network's internal minority recruitment efforts. With enormous internal support from the PROS network, minorities were recruited within PROS, finishing in August 2002. The PROS network surpassed their original targeted goal of enrolling 25% minorities; 33% were enrolled. With just 90 days to analyze study results, many of the bivariate and multivariate analyses have not been conducted yet.

The PROS network also had difficulty in engaging obstetricians in this project, possibly because of their maternal focus. The impact of the federal legislation may not have been as visible for obstetricians as it was for care providers of the newborns.

Limitations/Distortion

Funding limitations to 75% of original budget hampered our recruitment and data collection; the funding reductions have meant a smaller-than-anticipated project staff, leading to delays in project implementation and data collection. The study team was also significantly hampered in the area of minority recruitment. Despite the good faith attempts by the Brooklyn, NY-based minority health organization, Health Watch, their efforts were largely ineffectual, at a large direct cost to the study budget. However, once it became clear that their work was not producing the desired outcomes, and that future efforts were likely to be equally unsuccessful, their participation was terminated.

An additional concern with the generalizability of study results comes from the method of obtaining data: we relied on volunteer practices from the PROS network. This potential source of bias could not be accounted for easily in analyses, since outcome data for non-participant practitioners were obviously not available. Please see the analytic plans detailed above. The preliminary results detailed in this report are limited in that they only represent about half of the total sample size, and have a smaller percentage of minorities, unlike that of the full sample size.

The generalizability of study results is also affected by the extent of non-response. The response rates are lowest for the Mother's Follow-up Questionnaire (59% currently) and the Obstetrical Questionnaire (64% currently). The effects of non-response are additive for analyses that require summarization across survey instruments. We will use appropriate missing data techniques, such as multiple imputation, to improve the precision of our estimates and account for missing data.

Applications to Healthcare Delivery

Our findings support the recommendations of the Secretary of Health and Human Services' Advisory Committee on Infant Mortality (SACIM) preliminary report to Congress.^{12, 13} SACIM

recommends broadening the focus of concern beyond the issue of length of stay to the multiple important factors affecting maternal and infant health. This defines the goal of postnatal and postpartum services to achieve optimal newborn and maternal health in the short and long-term and ensure the delivery of health care after leaving the hospital, regardless of length of stay.¹³ The LAND study team would like to better educate maternal and child health providers about newborn discharge, in order to focus their efforts to optimize transition during the postpartum period.

Future Research

The LAND Score could provide a standardized means by which maternal and child health professionals can assess the mother and baby's readiness for postpartum discharge. The LAND Study team intends to validate a LAND score, which, similar to an APGAR score, will provide an assessment tool for discharging clinicians to use at the proposed time of discharge in determining the readiness of a mother and her infant to go home. It should also help quantify what postpartum discharge services and support are needed by them to maximize the transition to the ambulatory setting. The study team will explore readiness variables qualitatively in order to better develop specific interventions. Uniquely, we will be able to compare newborn practices *before* the federal legislation went into effect using LAND Pilot Study data with the *perceptions* of pediatricians after the federal legislation went into effect (LAND Periodic Survey) and finally with the real-time actions of pediatricians once the federal legislation in effect (main LAND Study). We also hope to investigate further the use of the SF-12 tools for physical and mental health status in postpartum mothers. The LAND Study team also plans to create and evaluate these interventions in addressing specific issues and timing identified in the study, such as breastfeeding, maternal depression, and social support.

List of Products

Peer-Reviewed Articles

1. Britton J, Baker A, Spino C, Bernstein HH. Postpartum Discharge Preferences of Pediatricians: Results From a National Survey. *Pediatrics* 2002;110:53-60.
2. Bernstein HH, Spino C, Baker A, Slora E, Touloukian C, McCormick M. Postpartum Discharge: Do Varying Perceptions of Readiness Impact Health Outcomes? *Ambulatory Pediatrics* 2002;2:388-95.

Abstracts

1. Bernstein H, Homer C, Baker A, Bocian A, Spino C, McCormick M. The First Two Weeks After Postpartum Discharge: Issues Facing Mothers. APA 1998 [Abstract 299] Poster presentation, *Arch of Pediatr Adolesc Med* 1998: 107.
2. Bernstein H, Spino C, Baker AE, Slora EJ, Homer C, McCormick M. Readiness for Postpartum Nursery Discharge: Do Varying Perceptions Make a Difference? [Abstract 179] Slide presentation, APA May 1999: 74.
3. Baker A, Spino C, Slora E, Britton J, Bernstein H. Newborn Hospital Discharge Practices of Pediatricians: Results From a National Survey. [Abstract 1103] Poster presentation *Ped Res* April 2001;49:194A.

Reviews, Chapters, and Editorials

1. Arnold S, Bernstein HH. Newborn Discharge: A Time To Be Thoughtful. *Contemporary Pediatrics*. 2000;17(10):47-69.
2. Arnold S, Bernstein HH. When should newborns be discharged? *Contemporary OB/GYN* 2000;45 (11):47-69.

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1. Bernstein HH. Primary Care Perspectives at Scientific Summit on the Optimal Timing of Hospital Discharge of Mothers and Neonates. “Beyond the Fourth Dimension: Assuring Quality Health Care for Mothers and Babies.” Maternal and Child Health Bureau. June, 1996.
2. Bernstein HH. Secretary’s Advisory Committee On Infant Mortality. “Early Postpartum Discharge: Evidence and Recommendations.” Maternal and Child Health Bureau. June, 2001

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Table 1. Infant Race/Ethnicity* for Full Study Cohort. (N=4329)

Race/Ethnicity of Infants	Number (%)
American Indian or Alaskan Native	18 (<1%)
Asian or Pacific Islander	103 (2%)
Black, not Hispanic	446 (10%)
Hispanic	795 (18%)
White, not Hispanic	2398 (55%)
Other or Unknown	505 (12%)
Multi-Racial	64 (2%)
Total	4329

* from Practitioner Initial Questionnaire. Some “Unknown” subjects will be more specifically classified once the race/ethnicity data from the Mother’s Enrollment Questionnaire is included.

Table 2. Practice Characteristics for First 2,370 Cases (N=68 practices).

	Percent of total
Practice Type	
Solo practitioner	16%
Two-physician practice	9%
Pediatric group	38%
Multispecialty group	13%
HMO staff model	3%
Medical school	10%
Non-government hospital	2%
Non-profit community health center	4%
City/county/state government hospital or clinic	3%
Other	2%
Practice Area	
Urban, inner city	9%
Urban, non-inner city	28%
Suburban	41%
Rural	22%

Table 3. Maternal/Infant Dyad Characteristics for First 2,370 Cases.

Characteristic	Summary
First baby	41%
Difficulty with prior neonates	16%
Minority Status (infant)	31%
Vaginal Delivery	79%
Maternal Education < high school	14%
Maternal age <18 years	2%
Maternal age <20 years	8%
Mean maternal age, years	27.8%

Table 4. Mother, Infant and Dyad Readiness for Discharge from the Maternal Perspective on the Day of Discharge for First 2,370 Cases.

	From Maternal Perspective		
	Do you feel that you left the hospital on the right day for YOU? N=2036	Do you feel that YOUR BABY left the hospital on the right day? N=2056	Do you feel that YOU AND YOUR BABY left the hospital on the right day? N=1998
	N (%)	N (%)	
YES	1777 (87%)	1871 (91%)	1728 (86%)
NO, SHOULD HAVE LEFT EARLIER	94 (5%)	41 (2%)	29 (1%)
Mother needs to care for other children at home	30 (32%)	8 (20%)	
Mother has concerns about insurance coverage	8 (9%)	1 (2%)	
Mother would have preferred it	37 (40%)	11 (28%)	
Mother was medically stable the prior day	31 (34%)	9 (22%)	
Baby was medically stable the prior day	N/A	19 (48%)	
Other	2 (2%)	2 (5%)	
NO, SHOULD STAY LONGER	165 (8%)	144 (7%)	109 (5%)
Mother needs more medical care for herself	55 (33%)	20 (14%)	
Baby needs more medical care	23 (14%)	48 (34%)	
Mother is too tired to care for the baby or herself	83 (51%)	45 (31%)	
Mother does not have support at home	20 (12%)	16 (11%)	
Mother needs more education about baby care or feeding	40 (25%)	29 (20%)	
Baby does not feed well yet	41 (25%)	48 (34%)	
Mother does not feel comfortable with breastfeeding yet	50 (31%)	46 (32%)	
Other	10 (6%)*	9 (6%)**	
DISCREPANCIES			132 (7%)

Note that the reasons for suboptimal LOS are not mutually exclusive

*Other for mother: social support/socioemotional: 1; mom/baby stay together and one stays longer: 1; misc: 7

**Other for baby: social support/socioemotional: 4; misc: 4

^ Discrepancies indicate that there was a disagreement between readiness for discharge for mom and baby

Table 5. Mother, Infant and Dyad Readiness for Discharge from the Pediatric Practitioner Perspective on the Day of Discharge for First 2,370 Cases.

	From Pediatric Practitioner Perspective		
	Do you feel that today is the right day for the MOTHER to be discharged? N=2252	Do you feel that today is the right day for THE BABY to leave the hospital? N=2329	Do you feel that today is the right day for BOTH THE MOTHER AND BABY to leave the hospital? N=2237
	N (%)	N (%)	N (%)
YES	2163 (96%)	2233 (96%)	2101 (94%)
NO, SHOULD HAVE LEFT EARLIER	15 (<1%)	27 (1%)	2 (<1%)
Mother needs to care for other children at home	1 (7%)	0	
Mother has concerns about insurance coverage	0	0	
Mother would have preferred it	3 (21%)	0	
Mother was medically stable the prior day	10 (71%)	2 (7%)	
Baby was medically stable the prior day	N/A	26 (96%)	
Other	1 (7%)	1 (4%)	
NO, SHOULD STAY LONGER	74 (3%)	69 (3%)	43 (2%)
Mother needs more medical care for herself	18 (24%)	2 (3%)	
Baby needs more medical care	8 (11%)	12 (17%)	
Mother is too tired to care for the baby or herself	18 (24%)	11 (16%)	
Mother does not have support at home	5 (7%)	4 (6%)	
Mother needs more education about baby care or feeding	23 (31%)	22 (32%)	
Baby does not feed well yet	18 (24%)	26 (38%)	
Mother does not feel comfortable with breastfeeding yet	18 (24%)	19 (28%)	
Other	6 (8%)*	6 (9%)**	
DISCREPANCIES[^]			91 (4%)

Note that the reasons for suboptimal LOS are not mutually exclusive

* Mom other: 4 social support/socioemotional; 1 mom/baby stay together and one needs a longer stay; 1 misc.

**Baby other: 2 social support/socioemotional; 4 misc.

[^]Discrepancies indicate that there was a disagreement between readiness for discharge for mom and baby

Table 6. Mother Readiness for Discharge from the Obstetrician Perspective on the Day of Discharge for First 2,370 Cases.

	From Obstetrician Perspective
	Do you feel that today is the right day for the MOTHER to be discharged? N=1630
	N (%)
YES	1557 (95%)
NO, SHOULD HAVE LEFT EARLIER	32 (2%)
Mother needs to care for other children at home	2 (6%)
Mother has concerns about insurance coverage	1 (3%)
Mother would have preferred it	16 (50%)
Mother was medically stable the prior day	19 (59%)
Baby was medically stable the prior day	N/A
Other	2 (6%)
NO, SHOULD STAY LONGER	41 (3%)
Mother needs more medical care for herself	11 (27%)
Baby needs more medical care	5 (12%)
Mother is too tired to care for the baby or herself	9 (22%)
Mother does not have support at home	5 (12%)
Mother needs more education about baby care or feeding	14 (34%)
Baby does not feed well yet	6 (15%)
Mother does not feel comfortable with breastfeeding yet	10 (24%)
Other	3 (7%)*

Note that the reasons for suboptimal LOS are not mutually exclusive

* Mom other: 2 mom/baby stay together and one needs a longer stay; 1 misc.

Table 7. Pediatric Practitioner Recommendations for Follow-up Appointments for First 2,370 Cases.

	Summary
DISCUSSED FOLLOW-UP PLAN	2285/2337 (98%)
EITHER OFFICE OR HOME CARE VISIT	2197 (99%)
OFFICE VISIT	2183/2192 (>99%)
If so, when? # of days	
Mean \pm SD	8.8 \pm 6.4
Median \pm IQR	7.0 \pm 11.0
Minimum, Maximum	0, 30
HOME CARE VISIT	189/1599 (12%)
If so, when? # of days	
Mean \pm SD	3.2 \pm 2.6
Median \pm IQR	2.0 \pm 2.0
Minimum, Maximum	1, 14

Table 8. Length of Stay for First 2,370 Cases.

LOS (days)	TYPE OF DELIVERY		
	Vaginal	C/S	All
N	1565	400	2007
Mean (SD)	1.7 (0.6)	3.0 (3.2)	2.0 (1.6)
Median (IQR)	1.7 (0.7)	2.9 (0.8)	1.8 (0.8)
Min, Max	0.04, 9.7	0.1, 63.5	0.04, 63.5
Short Length of Stay LOS < 48 hours			1246/2017 (68%)

Table 9. Follow-up Plans by Short Length of Stay (< 48 hours) for First 2,370 Cases.

	Short Length of Stay (LOS < 48 h)		Total
	No	Yes	
Either Office or Home Care Visit in ...			1896
>4 days	463 (63%)	682 (58%)	1145
<4 days p=0.0326	267 (37%)	484 (42%)	751
<3 days p=0.0308	218 (30%)	404 (35%)	622
<2 days	146 (20%)	270 (23%)	416
<1 days	43 (6%)	78 (7%)	121
Office Visit In ...			1881
>4 days	498 (68%)	748 (65%)	1246
<4 days	229 (32%)	406 (35%)	635
<3 days	188 (26%)	337 (29%)	525
<2 days	121 (17%)	211 (18%)	332
<1 days	30 (4%)	66 (6%)	96
Home Care Visit in ...			160
>4 days	14 (24%)	12 (12%)	26
<4 days p=0.0500	45 (76%)	89 (88%)	134
<3 days p=0.0288	36 (61%)	78 (77%)	114
<2 days	31 (53%)	65 (64%)	96
<1 days	13 (22%)	13 (13%)	26

Table 10. Follow-up Plans by Type of Delivery for First 2,370 Cases.

	Type of Delivery (PRACIQ)		Total
	Vaginal	C-Section	
Either Office or Home Care Visit in ...			1783
> 4 days	849 (60%)	252 (68%)	1101
≤ 4 days X^2 p=0.0075	562 (40%)	120 (32%)	682
≤ 3 days X^2 p=0.0015	470 (33%)	92 (25%)	562
≤ 2 days X^2 p=0.0041	316 (22%)	58 (16%)	374
≤ 1 days X^2 p=0.0302	96 (7%)	14 (4%)	110
Office Visit in ...			1769
> 4 days	922 (66%)	267 (73%)	1189
≤ 4 days X^2 p=0.0142	479 (34%)	101 (27%)	580
≤ 3 days X^2 p=0.0031	401 (29%)	77 (21%)	478
≤ 2 days X^2 p=0.0338	252 (18%)	49 (13%)	301
≤ 1 days X^2 p=0.0155	77 (6%)	9 (2%)	86
Home Care Visit in ...			140
> 4 days	17 (15%)	8 (28%)	25
≤ 4 days	94 (85%)	21 (72%)	115
≤ 3 days	80 (72%)	17 (59%)	97
≤ 2 days X^2 p=0.0147	70 (63%)	11 (38%)	81
≤ 1 days	20 (83%)	5 (17%)	25

Table 11. Follow-up Plans by Primigravid Status for First 2,370 Cases.

	First Baby?		Total
	No	Yes	
Either Office or Home Care Visit in...			1842
> 4 days	698 (65%)	441 (58%)	1139
≤ 4 days X^2 p=0.0012	377 (35%)	326 (42%)	703
≤ 3 days X^2 p=0.0037	310 (29%)	270 (35%)	580
≤ 2 days X^2 p<0.0001	192 (18%)	196 (26%)	388
≤ 1 days X^2 p=0.0077	54 (5%)	62 (8%)	116
Office Visit in...			1828
> 4 days	747 (70%)	482 (63%)	1229
≤ 4 days X^2 p=0.0034	321 (30%)	278 (37%)	599
≤ 3 days X^2 p=0.0177	267 (25%)	228 (30%)	495
≤ 2 days X^2 p=0.0017	159 (15%)	156 (21%)	315
≤ 1 days	47 (4%)	44 (6%)	91
Home Care Visit in...			143
> 4 days	14 (19%)	11 (16%)	25
≤ 4 days	60 (81%)	58 (84%)	118
≤ 3 days	47 (64%)	52 (75%)	99
≤ 2 days	37 (50%)	45 (65%)	82
≤ 1 days X^2 p=0.0051	7 (9%)	19 (28%)	26

Table 12. Health Care Utilization for the Infant in the First Four Weeks after Nursery Discharge for First 2,370 Cases.

N=1619-1624 responses*	N (%)	Mean \pm SD	Minimum, Maximum
Any	1567 (97%)	2.5 \pm 1.7	1, 23
Doctor's office	1446 (89%)	1.9 \pm 1.1	1, 10
Visiting nurse/Home care agency	204 (13%)	1.4 \pm 1.1	1, 8
Health center or clinic	171 (11%)	1.6 \pm 0.9	1, 8
Emergency room	76 (5%)	1.2 \pm 0.5	1, 4
After-hours care center	10 (1%)	1.0 \pm 0.0	1, 1
Outpatient clinic during regular hours	94 (6%)	1.7 \pm 1.3	1, 8
Breastfeeding/lactation consultant	220 (14%)	1.5 \pm 1.1	1, 9
Breastfeeding/lactation consultant among breastfeeding mothers only (n=1,327)	214 (16%)	1.5 \pm 1.1	1, 9

* N=1619 to 1624, depending on the number of missing variables for individual response items.

Table 13. Health Care Utilization for the Infant in the First Four Weeks after Nursery Discharge for First 2,370 Cases.

# Visits	Doctor's office	Visiting nurse/Home care	Health center / clinic	ER	After-hrs care center	Outpt clinic during regular hrs	Breastfeeding/lactation consultant
0	175 (11%)	1420 (87%)	1451 (89%)	1548 (95%)	1614 (99%)	1529 (94%)	1402 (86%)
1	644 (40%)	157 (10%)	101 (6%)	62 (4%)	10 (1%)	56 (3%)	156 (10%)
≥ 2	802 (49%)	47 (3%)	70 (5%)	14 (1%)	0	38 (3%)	30 (4%)

Table 14. Mother/Infant Readiness for Discharge from the Maternal and Pediatric Practitioner Perspective and Material Readiness for Discharge from the Obstetrician Perspective on the Day of Discharge for First 2,370 Cases.

Mother (Dyad)	Pediatrician (Dyad)	Obstetrician (Mom)	Number	Percent
Ready			936	78.2%
Not Ready*			261	21.8%
Total			1,197	
Breakdown of "Not Ready" by Maternal, Pediatric, and Obstetric Perspectives				
Not Ready	Not Ready	Not Ready	2	0.2%
Ready	Not Ready	Not Ready	8	0.7%
Not Ready	Ready	Not Ready	11	0.9%
Ready	Ready	Not Ready	30	2.5%
Not Ready	Not Ready	Ready	13	1.1%
Ready	Not Ready	Ready	47	3.9%
Not Ready	Ready	Ready	150	12.5%

* The case is defined as not ready if either the mother, pediatrician or obstetrician considered the dyad (for the mother or pediatrician) or mother (for the obstetrician) unready for discharge.

Table 15. Additional Services to Increase Maternal Confidence in Baby Care During the First Four Postpartum Weeks for First 2,370 Cases.

N=1580-1595*	N (%)
ANY METHOD	987 (62%)
More prenatal classes	227 (14%)
More time in the hospital for recovery from labor	270 (17%)
More patient education while in the hospital	371 (23%)
More visits to the pediatrician with baby after discharge	300 (19%)
Some or more home visits	352 (22%)
More help from anyone at home	521 (33%)
More help from both baby's father & others at home	237 (45%)
More help from only baby's father	134 (26%)
More help from only others at home	150 (29%)

* N=1580 to 1595, depending on the number of missing variables for individual response items.

Table 16. Consistency in Mother/Infant Readiness for Discharge.

	Day of Discharge	4 Weeks Post Discharge
Mothers		
➤ Unready (% total)	174/1348 (13%)	269/1348 (20%)
Pediatricians		
➤ Unready (% total)	80/1348 (6%)	70/1348 (5%)

Table 17. Health care utilization and concerns for mother and infant in the first two weeks post nursery discharge.

	Infant mean (S.D.)	Mother mean (S.D.)
# concerns	7.3 (8.6)	7.2 (9.1)
# phone calls	2.0 (2.4)	1.0 (1.4)
# medical visits	2.0 (1.8)	0.5 (1.0)
# ambulatory contacts	4.0 (3.7)	1.5 (2.0)
# home visits	0.2 (0.5)	0.1 (0.4)