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## Predictors for follow-up among postpartum patients enrolled in a clinical trial

Maureen K. Baldwin, MD MPH<sup>a</sup>, Kyle D. Hart, MS<sup>a</sup>, and Maria I. Rodriguez, MD MPH<sup>a</sup>

<sup>a</sup>Oregon Health & Science University, 3181 SW Sam Jackson Park Road, Mailcode UHN 50, Portland, OR 97239

### Abstract

**Objective**—To identify risk factors for failure to attend postpartum follow-up within three months of delivery, including social support, intrinsic motivation, insurance type, and prenatal care attendance.

**Study Design**—This planned secondary analysis is derived from a randomized controlled trial of patients intending intrauterine device (IUD) use following their delivery (n=197). Subjects were postpartum from a vaginal or cesarean birth at 32 weeks gestation. We obtained baseline demographics and certainty about their plan to receive a postpartum IUD. We administered validated scales for social support and intrinsic motivation at enrollment. We then reviewed health records for prenatal visits and any postpartum visit by 3 months, and performed logistic regression to assess for predictors of follow-up.

**Results**—A total of 38/197 subjects (19.3%) failed to attend any postpartum visit by three months. Subjects who failed to follow-up were more likely to have Medicaid versus private insurance (92% versus 8%,  $p<0.01$ ). Income  $< \$50,000$ , no car, younger age, unplanned pregnancy, unemployment, multiple children, missed prenatal visits, and late initiation of prenatal care were also associated with failure to follow-up. Higher scores for social support and goal-directed motivation were not significantly associated with follow-up.

**Conclusions**—In our cohort, we found that one in five participants did not attend a postpartum visit by three months. Several socioeconomic indicators are associated with loss to follow-up, most notably Medicaid insurance. Having high motivation and social support is not sufficient to predict successful follow-up.

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Corresponding Author Maureen K BALDWIN, MD, MPH, 3181 SW Sam Jackson Park Road, Mailcode UHN 50, Portland, OR 97239, Tel (503) 494-9762, schaum@ohsu.edu.

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Interim data from this study was presented at the Family Planning Fellowship meeting, San Francisco, CA, May 2013 as an oral presentation and at the North American Forum on Family Planning Conference, Miami FL, and October 2014 as a poster.

Clinical Trial Registration: [clinicaltrials.gov](http://clinicaltrials.gov) (NCT01594476)

## Keywords

Maternity care; postpartum visit; contraception; intrauterine device; insertion timing; immediate postpartum

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## 1. Introduction

The postpartum period is a busy time. For some families this includes increased economic stresses, infant feeding difficulties, and challenges with care for older children. These competing demands may cause women to neglect their own healthcare and miss their postpartum visit [1]. Failure to attend a postpartum visit can have important implications for a woman's health: evaluation for postpartum depression, blood pressure, breast health, and wound healing are typically addressed at this time. Often this visit is the only opportunity for inter-conception care, which includes glycemic control, weight management, contraception management, and discussion of birth spacing recommendations [2]. The American College of Obstetricians and Gynecologists emphasizes the importance of a full physical, social, and psychological assessment within six weeks of giving birth to protect and promote women's health [3].

A clear understanding of the barriers and facilitators of postpartum care attendance can help guide innovations to improve the obstetric care model. A prior study at our institution identified that 55% of postpartum subjects with Medicaid insurance who did not return for a scheduled postpartum contraception visit had limited prenatal care (<10 visits) [4]. In addition to prenatal care attendance and insurance type, we hypothesized that having limited social support and lower motivation to pursue contraception would be significant predictors of follow-up.

The objective of this secondary analysis was to determine whether poor attendance to prenatal care and validated measures of motivation and social support are lower among patients not returning for postpartum care. Our sample consisted of patients planning a postpartum intrauterine device (IUD) who were enrolled in a randomized controlled trial (RCT).

## 2. Material and Methods

This is a planned secondary analysis of data obtained from the Early Postpartum Intrauterine Device Study, a randomized, clinical trial (RCT) to examine outcomes associated with a scheduled three-versus six-week postpartum visit to place an IUD [5]. The study was conducted from February 2012 through December 2013 at Oregon Health & Science University (OHSU), an academic tertiary care hospital in Portland, Oregon with approximately 2400 deliveries per year.

The primary objective of this analysis is to identify predictors of failure to follow-up for postpartum care within three months after delivery, regardless of whether an IUD was ultimately received. We compared prenatal attendance between participants who did and did not follow-up. Secondary analyses included a comparison by follow-up status of validated

test score measurements for perceived social support and intrinsic motivation. The OHSU Institutional Review Board approved the study (IRB#8120).

Subjects included inpatient postpartum patients participating in an RCT comparing timing of IUD insertion at 3-versus 6-weeks postpartum, intending to use an IUD for contraception, with no contraindications to IUD use, and either public or private insurance coverage that included IUD insertion. Participants were 18 years old, English- or Spanish-speaking, and within five days of vaginal or cesarean delivery of a live singleton infant at 32 weeks gestation. Potential subjects were excluded if they were unable to return for postpartum care, including incarceration, upcoming travel, or living far away.

Most data on covariates were collected at the time of trial enrollment following informed consent. Data were collected and managed using REDCap electronic data capture tools hosted at OHSU [6]. Missing data were handled with case-wise deletion. We asked participants to respond to the question, “How sure are you about your plan to receive an IUD?” using a 100 mm visual analog scale (VAS) at the time of enrollment.

Participants also completed two validated 12-question psychological survey instruments at enrollment. The Snyder Hope Scale (Future Scale) includes four questions that reflect agency, four that reflect pathways, and four that are distracters. The total possible score for the Future Scale ranges from 8 to 64 [7]. Responses to this scale correlate well with other psychological tests designed to assess optimism, expectancy for attaining goals, and self-esteem. We planned to interpret this score as a measure of intrinsic motivation. We administered the Multidimensional Scale of Perceived Social Support (MDSS) to assess perceived social support, another possible indicator for the ability to carry out a plan [8]. There are three subscales for the MDSS: family, friends and significant other, with a possible score ranging from 4 to 28 for each subscale. We also assessed reported intendedness of the recent pregnancy [9].

Following enrollment, we scheduled a single postpartum visit at the allocated timing of 3-or 6-weeks ( $\pm 3$  days) with an Ob/Gyn faculty or midwife study provider in either the patient’s primary clinic or the Family Planning clinic, if her primary clinic did not perform IUD insertion. We did not aid with rescheduling or reminders.

One study investigator reviewed the electronic medical record charts for prenatal and postpartum care attendance. We defined the primary outcome as no record of a postpartum visit with a clinician prior to three months after delivery in the electronic medical record. The majority of subjects attended prenatal care at an outpatient clinic within our hospital system (93%). Other subjects were referred from nearby clinics, the majority of which have an electronic medical record that can be viewed within our system. In addition to chart review for this secondary study, the parent trial included phone/email follow up at 3, 4 and 6 months postpartum. For participants outside our medical system, we also accepted self-report of postpartum follow-up.

Our planned sample size for the original RCT had sufficient power to compare prenatal care attendance between those who had follow-up and those who did not, though fewer were needed for this outcome than for the primary outcome. The primary outcome was IUD

insertion by 3 months and had goal enrollment of 240, though slow enrollment resulted in study closure after 197 enrolled. In this cohort of both privately and publicly insured patients, we originally estimated that 48 (20%) subjects might not return for follow-up, and that 22/48 (45%) of subjects would have had limited prenatal care. For this planned secondary analysis, a total of 62 participants were needed to have 90% power and alpha <0.025 to detect a 40% difference in prenatal care attendance among those who did (90%) versus did not attend (50%) a postpartum visit within three months.

We used descriptive statistics to characterize the sample population and tested for differences between those who followed up and those who did not using Student's t-test, Wilcoxon's rank-sum test, Pearson's chi-squared test, or Fisher's exact test, as appropriate. To evaluate the ability of the VAS to discriminate between those who did and those who did not follow-up, we constructed a receiver operating characteristic (ROC) curve and calculated the c-statistic and Youden's criterion. To identify the best predictors of failure to follow-up for postpartum care, we constructed a logistic regression model, with model selection based on variable importance measures from a random forest.

### 3. Results

Of the 197 subjects who participated in the Early Postpartum IUD Study, 38 (19.3%) did not return for any postpartum care. The most dramatic difference between those who followed up and those who did not was insurance type: only 3 (3%) of patients using private insurance for delivery failed to follow-up, while 35 (37%) of those on Medicaid failed to follow-up ( $p<0.01$ ) (Table 1). As we hypothesized, participants who had missed a prenatal visit and had initiated prenatal care after 14 weeks were more likely to fail follow-up (14/41, 34% versus 23/155, 15%,  $p<0.01$  for any 'no show' versus perfect attendance, and 20/48, 42% versus 17/148, 12%,  $p<0.01$  for late prenatal care versus early). We performed a sensitivity analysis to assess whether randomization allocation to 3- or 6-week IUD insertion could have influenced subject return for follow-up and found no difference.

Interestingly, the validated scales of social support and intrinsic motivation were not associated with follow-up. Median values for all social support subscales were similar among participants regardless of follow-up. Because the family subscale was an important variable in the random forest analysis, we dichotomized it at 17 (based on the optimal cut-point identified in a classification tree) to adjust the multivariable regression model, but this variable was not a significant independent predictor. The mean score for the Future Scale was 46.5 (range 23–56), which did not vary significantly by follow-up status, and also was not significantly different between those receiving Medicaid versus private insurance. However, among Medicaid recipients, the total score for the Future Scale was slightly higher among those who did not follow-up (48.3 versus 45.9,  $p=0.04$ ).

A number of other variables that may be related to socioeconomic indicators differed between those who followed up for a postpartum visit, compared to those who did not. Not returning for a postpartum visit occurred more frequently among those with lower income, lower educational attainment, not owning a car, having had an unplanned pregnancy, planning to quit work or school, and having more than one child at home (Table 1,  $p<0.01$

for all). Participants under age 24 had high loss to follow-up (17/45, 38%) compared to those age 24 and older (21/152, 14%,  $p<0.01$ ).

Among Medicaid recipients, socioeconomic indicators did not predict follow-up. Having fewer than 10 prenatal visits was more common among those with loss to follow-up than in those who returned (68% versus 45%,  $p=0.06$ ). A majority of participants younger than age 24 were Medicaid recipients (84%), of whom 16/38 (42%) did not return for follow-up.

The median value for the VAS for intention to receive an IUD was similar among those who did or did not follow-up (97.0 versus 96.5 mm;  $p=0.68$ ). Nevertheless, very high scores appear to be predictive of follow-up (sensitivity=87%, specificity=29%).

In multivariable analysis, private insurance (versus Medicaid) was the strongest predictor of follow-up (OR: 10.4, 95% CI: 3.1, 48.1), followed by a VAS score for intention to receive an IUD of greater than or equal to 80 mm (OR: 1.9, 95% CI: 1.0, 9.2) and receipt of prenatal care prior to 14 weeks gestational age (OR: 2.3, 95% CI: 1.0, 5.7) (Table 2). There were no significant independent predictors for Medicaid recipients.

#### 4. Discussion

Even among motivated research subjects, one in five patients do not follow up with recommended postpartum care. All socioeconomic indicators, including financial instability and lower educational achievement, are associated with not returning, but the strongest predictor is Medicaid insurance. Initiation of prenatal care after the first trimester, missed prenatal visits, and fewer than 10 prenatal visits are associated with failure to follow-up. Psychological assessments for self-reported motivation and perceived social support are not significant predictors.

We expected the validated “Future Scale” to be able to identify those who have both agency and pathway, or “will and ways,” to follow through with a plan. However, the best behavioral predictor of future visit attendance is past attendance. There are likely forces stronger than motivation that impact utilization of healthcare services for this population.

Throughout this study period, nearly all pregnant patients in Oregon who did not have private insurance were eligible for Medicaid insurance, with coverage extending to 185% of the Federal Poverty Level through two months postpartum. These data are reassuring that nearly all privately insured and college-educated patients will follow-up. However, it is concerning that those who are probably at the highest need for postpartum support were less likely to return.

The predictors for loss to follow-up here are consistent with those in the much larger retrospective cohort in New York ( $n=4049$ ) [10]. They found non-attendance at a postpartum visit was more likely for patients using Medicaid or who were uninsured [Relative Risk (RR) 1.4, 95% Confidence Interval (CI) 1.2–1.6]. While a much smaller study, our prospective design allowed more precise classification of patient-level characteristics and the follow-up outcome and showed a more robust relationship. Our findings provide additional

evidence that insurance type is the most important predictor to identify patients at risk for health disparities due to inadequate access and utilization of postpartum health care services.

The main study limitation is a potential misclassification of whether subjects returned for follow-up. We reviewed the electronic medical record, which shares health visit information state-wide for most health systems, to locate subjects referred to our hospital who may have returned to their primary provider for follow-up. In all, 6.6% of subjects had prenatal care outside our health system. After phone/email contact, only 5/13 (38%) subjects outside our health system had no confirmation of follow-up. Differential follow-up measures could have resulted in an overestimation of loss to follow-up, but this would not be expected to be a differential bias with respect to demographic characteristics.

Another limitation of this study is generalizability. This study likely overestimates the proportion of postpartum patients who will return for follow-up because it only included research participants motivated to return for postpartum contraception who agreed to enroll and who were going to be compensated for returning regardless of whether they changed their mind about using an IUD. This is a best-case scenario and provides estimates for postpartum follow-up under the most ideal conditions. We tried to mimic real life clinic scheduling as much as possible for this cohort to avoid the potential impact of a clinical trial on return rates. For example, we did not provide additional help with rescheduling appointments, we did not provide extra appointment reminders, and we did not provide directed counseling about IUD insertion or side effects beyond what was discussed with their primary provider.

Attendance for participants enrolled in postpartum contraceptive studies who are actively seeking contraception seems no better than with patients not involved in research [10, 11]. However, short inter-pregnancy intervals can negatively impact a subsequent pregnancy, so contraception is a particularly important service for postpartum patients to receive early [12–14].

Our research and clinical efforts should work toward provision of high quality postpartum care. We recommend that options for contraceptive initiation be available during the maternity care hospitalization for all patients. Providers and health systems should facilitate easier access to postpartum services that might improve utilization among high-risk groups. Services such as home visits, telephone assessments, or mother-baby dyad visits could be conducted for those who have difficulty attending clinic appointments [15].

Healthcare innovations should focus efforts for postpartum care toward those with prior difficulty attending appointments. Research studies with postpartum outcomes should consider excluding potential subjects with a history of limited prenatal care. Health systems should focus efforts and resources for immediate initiation of contraception during the maternity care hospitalization.

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## References

1. D'Angelo D, Williams L, Morrow B, Cox S, Harris N, Harrison L, et al. Preconception and interconception health status of women who recently gave birth to a live-born infant—Pregnancy Risk Assessment Monitoring System (PRAMS), United States, 26 reporting areas, 2004. *MMWR Surveill Summ.* 2007; 56(10):1–35.
2. Verbiest S, Bonzon E, Handler A. Postpartum Health and Wellness: A Call for Quality Woman-Centered Care. *Matern Child Health J.* 2016; 20(Suppl 1):1–7.
3. Committee Opinion No. 666: Optimizing Postpartum Care. *Obstet Gynecol.* 2016; 127(6):e187–92. [PubMed: 27214194]
4. Simmons KB, Edelman AB, Li H, Yanit KE, Jensen JT. Personalized contraceptive assistance and uptake of long-acting, reversible contraceptives by postpartum women: a randomized, controlled trial. *Contraception.* 2013; 88(1):45–51. [PubMed: 23218851]
5. Baldwin MK, Edelman AB, Lim JY, Nichols MD, Bednarek PH, Jensen JT. Intrauterine device placement at 3 versus 6 weeks postpartum: a randomized trial. *Contraception.* 2016; 93(4):356–63. [PubMed: 26686914]
6. Harris PA, Taylor R, Thielke R, Payne J, Gonzalez N, Conde JG. Research electronic data capture (REDCap)—a metadata-driven methodology and workflow process for providing translational research informatics support. *J Biomed Inform.* 2009; 42(2):377–81. [PubMed: 18929686]
7. Snyder CR, Harris C, Anderson JR, Holleran SA, Irving LM, Sigmon ST, et al. The will and the ways: development and validation of an individual-differences measure of hope. *J Pers Soc Psychol.* 1991; 60(4):570–85. [PubMed: 2037968]
8. Zimet GD, Powell SS, Farley GK, Werkman S, Berkoff KA. Psychometric characteristics of the Multidimensional Scale of Perceived Social Support. *J Pers Assess.* 1990; 55(3–4):610–7. [PubMed: 2280326]
9. Shulman HB, Gilbert BC, Msphbrenda CG, Lansky A. The Pregnancy Risk Assessment Monitoring System (PRAMS): current methods and evaluation of 2001 response rates. *Public Health Rep.* 2006; 121(1):74–83. [PubMed: 16416701]
10. Wilcox A, Levi EE, Garrett JM. Predictors of Non-Attendance to the Postpartum Follow-up Visit. *Matern Child Health J.* 2016; 20(Suppl 1):22–7. [PubMed: 27562797]
11. Chen BA, Reeves MF, Creinin MD, Schwarz EB. Postplacental or delayed levonorgestrel intrauterine device insertion and breast-feeding duration. *Contraception.* 2011; 84(5):499–504. [PubMed: 22018124]
12. Zhu BP. Effect of interpregnancy interval on birth outcomes: findings from three recent US studies. *International journal of gynaecology and obstetrics: the official organ of the International Federation of Gynaecology and Obstetrics.* 2005; 89(Suppl 1):S25–33.
13. D'Angelo D, Williams L, Morrow B, Cox S, Harris N, Harrison L, et al. Preconception and interconception health status of women who recently gave birth to a live-born infant—Pregnancy Risk Assessment Monitoring System (PRAMS), United States, 26 reporting areas, 2004. *MMWR Surveill Summ.* 2007; 56(10):1–35.
14. Zhu BP, Rolfs RT, Nangle BE, Horan JM. Effect of the interval between pregnancies on perinatal outcomes. *The New England journal of medicine.* 1999; 340(8):589–94. [PubMed: 10029642]
15. Uhm S, Pope R, Schmidt A, Bazella C, Periera L. Home or office etonogestrel implant insertion after pregnancy: a randomized trial. *Contraception.* 2016; 94(5):567–71. [PubMed: 27373542]

### Implications

The main predictors for not attending a postpartum visit are Medicaid insurance or limited prenatal care, and not social support or intrinsic motivation. Interventions to improve postpartum contraception uptake should focus efforts on provision of immediate postpartum contraception for this population.



Demographic and clinical characteristics of all enrolled postpartum patients and Medicaid recipients only by follow-up status (attended any postpartum visit within 3 months).

**Table 1**

Characteristics <sup>•</sup>	All Subjects			Medicaid Recipients		
	Follow-up n=159	No follow-up n=38	p	Follow-up n=60	No follow-up n=35	p
Age	29.7 ± 5.8	25.6 ± 4.3	<0.01 <sup>*</sup>	26.6 ± 5.8	25.3 ± 4.0	0.22 <sup>*</sup>
Ethnicity Hispanic (vs non-Hispanic)	20 (13)	7 (18)	0.50 <sup>‡</sup>	15 (25)	6 (17)	0.53 <sup>‡</sup>
Primary language Spanish (vs English)	4 (3)	2 (5)	0.33 <sup>‡</sup>	2 (3)	2 (6)	0.62 <sup>‡</sup>
Education less than college (vs more)	32 (20)	22 (58)	<0.01 <sup>‡</sup>	25 (42)	21 (60)	0.13 <sup>‡</sup>
Income < 50k (vs 50k)	63 (45)	31 (91)	<0.01 <sup>‡</sup>	46 (92)	30 (94)	1.00 <sup>‡</sup>
Pregnancy was not planned (vs planned)	71 (45)	26 (68)	0.01 <sup>‡</sup>	45 (75)	25 (71)	0.89 <sup>‡</sup>
Preterm birth (< 37 vs 37 weeks)	8 (5)	8 (21)	<0.01 <sup>‡</sup>	5 (8)	8 (23)	0.06 <sup>‡</sup>
Two or more children (vs only infant)	66 (42)	25 (66)	0.01 <sup>‡</sup>	29 (48)	23 (66)	0.15 <sup>‡</sup>
Early randomization timing 3 vs 6 weeks)	77 (48)	23 (61)	0.25 <sup>‡</sup>	26 (43)	22 (63)	0.11 <sup>‡</sup>
Any missed prenatal visits (vs none)	27 (17)	14 (38)	0.01 <sup>‡</sup>	17 (28)	13 (38)	0.45 <sup>‡</sup>
Limited prenatal care (vs 10 visits)	48 (30)	24 (65)	<0.01 <sup>‡</sup>	27 (45)	23 (68)	0.06 <sup>‡</sup>
Late prenatal care ( 14 vs < 14 weeks)	28 (18)	20 (54)	<0.01 <sup>‡</sup>	21 (35)	19 (56)	0.08 <sup>‡</sup>
VAS < 80 mm (vs 80 mm)	19 (12)	11 (29)	0.02 <sup>‡</sup>	7 (12)	10 (29)	0.07 <sup>‡</sup>
Multidimensional Scale of	69.0	67.0		69.0	67.0	
Perceived Social Support (MDSS) total	(61.0–72.0)	(59.0–72.0)	0.61 <sup>§</sup>	(61.8–72.0)	(59.2–72.0)	0.53 <sup>§</sup>
Future Scale total	46.2 ± 6.3	48.0 ± 5.2	0.07 <sup>*</sup>	45.9 ± 5.7	48.3 ± 5.2	0.04 <sup>*</sup>

Data are n (%) or median and inter-quartile range, x.x (x.x-x.x); x ± x indicates mean ± standard deviation.

<sup>•</sup> Missing data handled case-wise. All variables with 0–1 missing cases except income with n=175 for all subjects and n=82 for Medicaid recipients.

<sup>\*</sup> Student's t-test (two-sided)

<sup>‡</sup> Pearson's chi-squared test

<sup>‡</sup> Fisher's exact test

<sup>§</sup> Wilcoxon rank-sum test with continuity correction

**Table 2**

Multivariable logistic regression of factors related to postpartum follow-up within 3 months among postpartum patients seeking intrauterine device (IUD) for contraception.

<b>Covariates: OR (95% CI) *</b>	<b>All Subjects n=197</b>	<b>Medicaid Recipients n=95</b>
Age (per year increase)	1.0 (0.9, 1.1)	1.02 (0.9, 1.1)
Preterm birth (< 37 weeks)	0.4 (0.1, 1.6)	0.4 (0.1, 1.5)
3-week follow-up group (vs 6-week group)	0.7 (0.3, 1.6)	0.5 (0.2, 1.3)
Private insurance (vs Medicaid)	10.4 (3.1, 48.1)	–
Prenatal care prior to 14 weeks	2.3 (1.0, 5.7)	2.1 (0.8, 5.4)
Score > 17 on MDSS * family subscale	1.9 (0.7, 5.5)	2.3 (0.8, 7.3)
VAS for IUD intention 80mm	3.1 (1.0, 9.2)	2.7 (0.8, 8.8)

\* Multidimensional Scale of Perceived Social Support (MDSS)

° Model includes age, preterm birth, randomization group, insurance, prenatal care initiation, MDSS family subscale, and VAS for IUD intention 80mm

All Subjects: Null deviance = 189.1; Deviance = 137.8; AIC = 149.8; BIC = 169.4

Medicaid Only: Null deviance = 123.0; Deviance = 108.9; AIC = 122.9; BIC = 140.7