

Interconception Care for Mothers During Well-Child Visits With Family Physicians: An IMPLICIT Network Study

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ABSTRACT

PURPOSE Interconception care (ICC) is recommended to improve birth outcomes by targeting maternal risk factors, but little is known about its implementation. We evaluated the frequency and nature of ICC delivered to mothers at well-child visits and maternal receptivity to these practices.

METHODS We surveyed a convenience sample of mothers accompanying their child to well-child visits at family medicine academic practices in the IMPLICIT (Interventions to Minimize Preterm and Low Birth Weight Infants Through Continuous Improvement Techniques) Network. Health history, behaviors, and the frequency of the child's physician addressing maternal depression, tobacco use, family planning, and folic acid supplementation were assessed, along with maternal receptivity to advice.

RESULTS Three-quarters of the 658 respondents shared a medical home with their child. Overall, 17% of respondents reported a previous preterm birth, 19% reported a history of depression, 25% were smoking, 26% were not using contraception, and 58% were not taking folic acid. Regarding advice, 80% of mothers who smoked were counseled to quit, 59% reported depression screening, 71% discussed contraception, and 44% discussed folic acid. Screening for depression and family planning was more likely when the mother and child shared a medical home ($P < .05$). Most mothers, nearly 95%, were willing to accept health advice from their child's physician regardless of whether a medical home was shared ($P > .05$).

CONCLUSIONS Family physicians provide key elements of ICC at well-child visits, and mothers are highly receptive to advice from their child's physician even if they receive primary care elsewhere. Routine integration of ICC at these visits may provide an opportunity to reduce maternal risk factors for adverse subsequent birth outcomes.

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INTRODUCTION

Interconception care (ICC) is defined as care provided to mothers between pregnancies to improve health outcomes for women, newborns, and children.¹ It includes interventions that modify risk factors in order to promote healthy outcomes of subsequent pregnancies.² In 2006, the Centers for Disease Control and Prevention Work Group and Select Panel on Preconception Care recommended risk assessment and intervention in the interconception period, especially for women with previous adverse birth outcomes.³ ICC recommendations regarding maternal depression, tobacco use, folic acid supplementation, and family planning are supported by evidence suggesting that addressing these factors reduces poor birth outcomes.⁴⁻¹⁴

ICC has been broadly advocated but not widely implemented.^{15,16} Barriers include limited access to health care between pregnancies, maternal focus on their infant to the exclusion of their own personal health needs,

inadequate knowledge of ICC among clinicians, and lack of an established ICC model. Continuity of care with the same primary care clinician or practice over time has been associated with improved outcomes, including increased use of preventive services, better adherence to clinician recommendations, and lower total costs, although it has not been well studied in the context of maternal and child care delivery.¹⁷ Evidence also suggests that mothers regularly attend their child's health care visits even if they do not seek care for themselves between pregnancies.^{18,19} Previous studies have found that most mothers accept inquiry about health behaviors and referral for services at well-child visits.²⁰⁻²² Pilot studies have shown incorporation of maternal assessment into these visits to be achievable.²³

The purpose of this study was to investigate ICC practices by family physicians at well-child visits. We focused on maternal depression, tobacco use, folic acid supplementation, and family planning because of the strength of evidence for addressing these factors when aiming to reduce poor birth outcomes.^{4,6,8,24} We hypothesized that mothers would report infrequent ICC at well-child visits, that approaches among physicians would vary, and that women who did not receive care from the same practice as their child would report receiving less ICC than those who shared a medical home. A secondary goal was to examine maternal health behaviors, beliefs, and receptivity to health advice provided by their child's physician.

METHODS

Study Design

In this cross-sectional study, we surveyed a convenience sample of mothers 13 years of age and older accompanying their children to well-child visits at 12 months of age (range, 10-14) and 24 months of age (range, 22-26). Questionnaires were administered at 12 US family medicine academic practices participating in the IMPLICIT (Interventions to Minimize Preterm and Low Birth Weight Infants Through Continuous Improvement Techniques) Network, a perinatal collaborative quality initiative of family medicine residency programs in the eastern United States²⁵ (Supplemental Appendix 1 and Supplemental Appendix 2, available at <http://annfammed.org/content/14/4/350/suppl/DC1>). We selected the 12- and 24-month well-child visits, 2 representative points in the typical interconception period, to allow evaluation of potential changes in ICC delivery as time elapsed from the index birth.

The questionnaire (in both English and Spanish) was developed specifically for this project and was reviewed for readability and conformity to a 6th-grade reading level. It was offered by site personnel to all

mothers before their child's well-child visit. After reading a voluntary consent statement, mothers who agreed to participate completed the questionnaire and returned it to site personnel. Comprehension of written or spoken English or Spanish was required for participation. Completed questionnaires were mailed to the Lancaster General Research Institute, where they were entered into a secure database. Questionnaires were administered from January 1, 2011 through October 18, 2012, although specific time frames varied among sites because of the timing of study approval and differences in pediatric patient volume. Sites had a goal of obtaining at least 50 completed questionnaires. The study was approved by the institutional review boards of participating sites.

Survey Measures

The questionnaires used are provided as supplemental material (Supplemental Appendix 3 and Supplemental Appendix 4, available at <http://annfammed.org/content/14/4/350/suppl/DC1>). Briefly, demographic measures include age, race, ethnicity, and insurance status. Maternal health characteristics evaluated include medical history, pregnancy outcomes, and current pregnancy intent (assessed with questions in both multiple choice and fill-in-the-blank formats). We inquired if mothers received care from the same practice as their child (referred to as sharing a medical home) or received prenatal care from their child's physician (yes or no format). We assessed the use of folic acid, family planning strategies, and tobacco (both multiple choice and fill-in-the-blank formats). Respondents were asked if their child's physician inquired about or addressed depression, tobacco use, family planning, and folic acid supplementation since their child's birth (yes or no, and multiple choice formats). Depression diagnosis was defined as having ever been told by a physician that they were depressed. Finally, maternal beliefs regarding the impact of personal health and receptivity to advice from their child's physician were evaluated (yes or no, and true or false formats).

Data Analysis

We used descriptive statistics to characterize respondents, evaluate the frequency with which risk factors were addressed, and summarize health beliefs and receptivity to advice from the child's physician. Questionnaires that did not indicate that the child was seen for a 12- or 24-month well-child visit were excluded from the analysis as we could not verify that the inclusion criteria were met. Responses at 12 and 24 months differed only with respect to the incidence of pregnancy since the index birth and were therefore combined for analysis and presentation. Response fre-

quencies are expressed as percentages. We compared women who shared a medical home with their child and those who did not with χ^2 analysis. Odds ratios were calculated using logistic regression analysis and then adjusted for the potential effect of location of care using a random effects logistic regression model.²⁶ All statistical analysis was performed using Stata version 13 (StataCorp LP).

RESULTS

Survey Respondents

A total of 694 questionnaires were offered and 672 (97%) were completed, with only 22 mothers declining participation. In all, 658 questionnaires met criteria to be included in the analysis. The number of questionnaires completed per site ranged from 9 to 108, with a mean of 54 per site (Supplemental Appendix 1).

Respondent demographics, medical history, language preferences, and sources of care are summarized in Table 1. Approximately two-thirds of mothers self-identified as members of a racial or ethnic minority. Three-quarters shared a medical home with their child, and slightly more than one-half received prenatal care from their child's physician.

Maternal Health, Behaviors, Beliefs, and Related ICC

Health conditions, behaviors, and beliefs reported by mothers and receipt of ICC from family physicians are summarized in Table 2. Respondents reported numerous risk factors for adverse birth outcomes, including psychiatric conditions and tobacco use. Approximately one-half of mothers who did not wish to be pregnant were not using contraception, and more than one-half were not taking a folic acid supplement.

Regarding ICC, the majority of respondents who smoked reported they were advised to quit. More than one-half reported depression screening, and of those with depression, three-quarters were referred for counseling or treatment. Still, approximately 41% of mothers reported no depression screening, and fewer than one-half reported receiving advice about folic acid. Most respondents, 82.9%, indicated a belief that their health affects the health of their children and future pregnancies, and the overwhelming majority, 94.7%, indicated a willingness to receive personal health advice from their child's physician.

Comparison of Mothers by Source of Care

A comparison of reported ICC advice and health beliefs for mothers who shared a medical home with their child vs those who did not is presented in Table 3. There were no differences in addressing folic acid or

Table 1. Characteristics of Respondents (N = 658)

Maternal Characteristic ^a	Respondents, %
Race/ethnicity	
White	32.7
Black	35.0
Asian	3.0
Other	28.3
Hispanic	32.9
Insurance status	
Government	73.6
Private	15.8
Self-pay	10.6
Medical history	
Diabetes	2.2
Hypertension	6.1
Seizures	1.6
Preterm birth	16.6
Survey language preference	
English	84.2
Spanish	15.8
Source of care	
Received pregnancy care from child's physician	57.0
Receives care from same practice as child (shared medical home)	74.2

^a Mean age was 26.5 years.

Table 2. Maternal Health, Behaviors, Beliefs, and Related Interconception Care

Characteristic	Respondents, %
Depression	
History of depression (ever)	19.1
History of other psychiatric condition	12.7
History of depression since index child's birth	59.0
Depression screening performed	16.1
Depression addressed (if depressed since index child's birth)	75.3
Folic acid	
Not currently using folic acid supplement	58.1
Folic acid use addressed	44.4
Smoking	
Currently smoking	24.5
Smoking addressed (if currently smoking)	80.3
Family planning	
Pregnant since index child's birth	16.8
Currently using contraception	73.7
Family planning addressed	70.6
Health beliefs	
"I believe that my health affects the health of my children and children from future pregnancies."	82.9
"I am willing to take advice about my health that affects my children from my child's doctor."	94.7

Table 3. Comparison of Health Advice and Beliefs Among Mothers by Source of Care

Characteristic	Respondents, %		Unadjusted OR	Adjusted OR ^b	Adjusted P Value
	Same Practice ^a	Different Practice			
Depression					
Depression screening done	63.9	45.6	2.11	3.04	.000
Report receiving some treatment advice (if told had depression)	76.0	71.4	1.27	1.27	.67
Folic acid use addressed	45.2	42.2	1.13	1.39	.12
Smoking addressed (if currently smoking)	80.5	78.3	1.15	1.15	.81
Family planning addressed	76.1	57.1	2.44	2.31	.00
Health belief: "I am willing to take advice about my health that affects my children from my child's doctor."	94.6	94.8	0.97	0.97	.94

OR = odds ratio.

^a Shared medical home.^b Controlled for intraclass correlation by location.

tobacco use; however, mothers who shared a medical home with their child were significantly more likely to report depression screening (64% vs 46%, adjusted odds ratio = 3.04, $P < .001$) and inquiry or counseling about family planning (76% vs 57%, adjusted odds ratio = 2.31, $P < .001$). Willingness to receive health advice from their child's physician did not differ significantly between these groups. There were significant intraclass correlations for the participants within practice sites, with values ranging from 0.028 to 0.050, for all comparisons except smoking, depression treatment, and health beliefs.

DISCUSSION

To our knowledge, this study is among the first to investigate ICC practices by family physicians at well-child visits and to characterize maternal health behaviors and beliefs during the interconception period. Our findings suggest that a substantial portion of mothers have risk factors for adverse subsequent birth outcomes. Although our results are based on self-report, several findings, such as the frequency of maternal smoking and contraceptive use, are consistent with those of other studies suggesting the validity of this strategy.²⁷

Our results also indicate that mothers sharing a medical home with their child were more likely to be screened for depression and to receive family planning advice. This pattern may reflect increased physician comfort in addressing sensitive issues when the mother is their patient or receives care within their practice. It is consistent with the literature describing the effects of continuity of care, although clinician continuity with mother and child has not been well studied. Our survey instrument did not specifically ask if mothers currently receive care from their child's physician, so

the impact of this relationship cannot be determined. Previous studies found that continuity with the same practice has many of the benefits observed with clinician continuity.¹⁷ Benefits of continuity within a shared medical home when clinicians are distinct is possible and should be further studied.

It is noteworthy that nearly all mothers were receptive to inquiry and advice from their child's physician regardless of whether they shared a medical home with their child. Previous studies in pediatric practices also found high maternal receptivity to health advice at well-child visits.^{20,28-35} This association suggests that well-child visits are an underused opportunity to address maternal risks for poor subsequent birth outcomes. The ICC approach we explored is consistent with recommendations by the American Academy of Pediatrics, which strongly advocates screening for maternal conditions such as smoking and depression at well-child visits.³⁶

The strengths of this study include the participation of 658 mothers at 12 different sites. The extremely high response rate of 97% increases the likelihood that our sample is representative of larger populations of mothers and their children. This study also has a number of limitations that may reduce the generalizability of our findings. We used a convenience sample of mothers who read or understood English or Spanish. Responses were based on recall and were not validated by other objective methods, which could have led to recall bias. The survey wording precludes us from determining if some advice was actually provided at well-child visits. Respondents left some items blank resulting in a variable sample size for each item; missing data did not exceed 10%, however, for any individual item except maternal age (14%). The timing of survey administration at some sites could have allowed a few mothers to participate more than once, although

this number would have been small and unlikely to have a substantial impact on the results. The number of completed questionnaires varied among sites, and 2 sites contributed very few because of administrative and study personnel changes. Because eliminating these questionnaires did not change our results, we included them in our analysis; however, the possibility of selection bias must be considered. Finally, this survey was conducted solely within academic family medicine practices participating in a perinatal collaborative quality initiative network. Most of these practices provide maternity care, which may have increased the frequency of ICC screening and advice. Further study in a variety of community practice settings is needed.

The opportunity to improve birth outcomes by addressing maternal risk factors at well-child visits holds great appeal. A brief, standardized ICC model could hasten widespread implementation. All pediatric care clinicians should be educated about the potential benefits of ICC, the challenge of reaching mothers during the interconception period, and the high maternal acceptability of receiving personal health advice at well-child visits. Partnerships are needed with community resources that provide mothers with services and interventions that can ultimately reduce risks for adverse outcomes in subsequent pregnancies.

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Key words: mothers; infant; preconception care; premature birth; pregnancy; depression; smoking; folic acid; contraception; continuity of patient care; practice-based research; primary care

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