2021

Postplacental Intrauterine Device Insertion: Efficacy and Barriers

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POSTPLACENTAL INTRAUTERINE DEVICE INSERTION: EFFICACY AND BARRIERS

A MASTER'S PROJECT

SUBMITTED TO THE GRADUATE FACULTY

OF THE GRADUATE SCHOOL

BETHEL UNIVERSITY

BY

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IN PARTIAL FULFILLMENT OF THE REQUIREMENTS

FOR THE DEGREE OF

MASTER OF SCIENCE IN NURSING

MAY 2021

BETHEL UNIVERSITY

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May 2021

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Acknowledgments

To my beautiful children, thank you so much for your resilience and unconditional love during this challenging time. Matthew and Luke, thank you for your patience when life was chaotic and I could not be as present as I once was. To my sweet babies, Benjamin and Eloise—what a crazy time to come into this life. It is almost like God knew you would need a buddy in this hectic world so he sent us two! You are all four so good and full of life. Bringing all of you into this world is my greatest adventure. It is my hope that you all can see the importance of realizing goals and not becoming engulfed in a single role in life but instead maintaining your own sense of self no matter what comes.

To my husband, Thomas, thank you. While your own career did not always make it possible to provide support in a physical sense during this program, I have always felt your love and encouragement no matter the distance separating us. Thank you for sacrificing when you can to help me realize my own potential. Thank you for absorbing some of my responsibility and for being a great teammate!

I would also like to express my gratitude to my advisor, Katrina Wu. She has lifted me up in more ways than I can count throughout my three years in this graduate program. Her encouragement gave me confidence to continue when I wished to quit. Her grace helped me to thrive academically even though I was struggling. She is a true model of who I want to become as a practitioner and mentor.

My beautiful MWI cohort friends, I truly could not have completed this program without you. We have weathered tragedies together, celebrated together, and commiserated together. I cannot imagine this journey without all of you in it. I love you all more than you know.

Amanda Carrell

Abstract

Background/Purpose: As many as half of all women do not attend postpartum care and receive desired family planning care. Left with little to no resources for obtaining contraception, many go on to have subsequent unplanned pregnancies. The American College of Obstetricians and Gynecologists has stated that offering long-term, reversible contraception at the time of birth should be considered for these women, yet adoption of this procedure remains low. This literature review will evaluate the efficacy and advantages of postplacental intrauterine device placement and barriers to implementing the procedure.

Theoretical Framework: The Health Belief Model can be used to frame conversations about family planning and contraception choices. Because the Health Belief Model relies on a person recognizing a need for improved health status and empowers the person to make decisions autonomously; utilizing this model stresses the need for patients to have postplacental IUD placement available for choice.

Methods: A search of multiple databases was performed utilizing a PRISMA tool. Eighteen articles were identified as being relevant to the practice question and were analyzed for data and results. CINAHL, PubMed, and Scopus were utilized for article search. Articles that were published in the last ten years, peer-reviewed, and in English were considered. Qualitative articles regarding IUD placement perspective on breastfeeding or male partner perspective were excluded.

Results/Findings: Intrauterine device insertion rates were consistently higher in those groups that received the device postplacentally versus in the clinic postpartum. Rate of continued use at one year was as high or higher for those receiving devices placed postplacentally compared to in clinic postpartum, despite an increase in expulsion rates for devices placed postplacentally.

Parity and route of delivery were the most correlated factors influencing expulsion. Provider knowledge deficit and insurance reimbursement were identified as barriers.
Implications for Research and Practice: Nurse-midwives should use this information to lobby for this practice to be offered within facilities as well as at a state level for more expansive coverage of postplacental intrauterine insertion.

Keywords: Immediate postpartum intrauterine device placement, postplacental LARC, postplacental IUD, postplacental Mirena, postplacental Paragard, postpartum IUD, postpartum IUD after vaginal delivery, IUD short interval pregnancy, barriers to postplacental LARC, and barriers to postplacental IUD.

Table of Contents

Chapter One: Introduction

In the United States each year, 33% of pregnancies have an interpregnancy interval (IPI) less than the recommended 18 months between the end of one pregnancy and the beginning of another pregnancy (American College of Obstetricians and Gynecologists [ACOG], 2019). Women of color, women in lower socioeconomic groups, and other marginalized groups are at the highest risk for experiencing a shortened interpregnancy interval (ACOG, 2019). Because interpregnancy interval is a modifiable risk factor for worsened maternal and neonatal outcomes such as preeclampsia, prematurity, and low birth weight as well as maternal and neonatal mortality, care should be taken to allow women the greatest access possible to family planning resources (ACOG, 2019).

With nearly half of all pregnancies in the United State being unplanned, access to family planning resources is critical. Unplanned pregnancies and short-interval pregnancies contribute to adverse maternal and neonatal outcomes and perpetuate the cycle of poverty (ACOG, 2019). Recognizing this, the United States Department of Health and Human Services (DHHS) added multiple family planning goals to the *Healthy People 2030* national goals and now include access to family planning, reduction in adolescent pregnancy, and increase in use of contraception, particularly in populations at risk for unintended pregnancy (United States Department of Health and Human Services [DHHS], n.d.).

Statement of Purpose

The purpose of this paper is to review and synthesize the literature surrounding immediate postplacental administration of intrauterine devices, specifically identifying its efficacy and barriers to implementation.

Evidence Identifying Need

In order to aid in the decrease of unplanned pregnancies and improve perinatal outcomes, the American College of Obstetricians and Gynecologists (2020) issued *Committee Opinion 670*, an expert opinion on the use of immediate postpartum long-acting reversible contraception (LARC), including intrauterine devices (IUD) and the Nexplanon implant. This committee opinion states that "LARC should be offered as an effective option for postpartum contraception", particularly with adequate counseling on the risks and benefits; hospital organizations should also work to improve infrastructure to allow for this offering as well as seek to receive adequate and appropriate reimbursement, both publicly and privately funded (American College of Obstetricians and Gynecologists [ACOG], 2020). The committee goes on to recommend that LARC is unable to be administered immediately postpartum and therefore should be offered in the comprehensive postpartum time period. This ACOG committee statement is endorsed by the American College of Nurse-Midwives, the Society of Maternal-Fetal Medicine, the American Academy of Family Physicians, and the Association of Women's Health, Obstetric and Neonatal Nurses (ACOG, 2020).

In 2015, the Cochrane Library published a systematic review investigating the efficacy and appropriateness of offering immediate postplacental IUD placement. This systematic review concluded that while evidence may be limited, the potential risks of waiting for postpartum placement, such as the abrupt self-withdrawal of comprehensive postpartum care being reported as high as 50%, outweigh the risks of placement postplacentally, the largest of those being expulsion (Lopez et al., 2015). Even considering the potential for expulsion, insertion of postplacental IUDs have a positive impact on decreasing unintended pregnancies (Cohen et al.,

2016). The Cochrane systematic review did identify a lack of large population trials and noted that this is an area for future research (Lopez et al., 2015).

UpToDate addresses postplacental IUD insertion in its larger intrauterine device topic. In this expert guide, it is noted that postplacental IUD insertion is an acceptable method of offering contraception and family planning to postpartum patients (Bartz & Pocius, 2019). Bartz and Pocius also note that the ability to reach the fundus of the immediately evacuated uterus proves to be the biggest challenge to insertion. UpToDate concludes that research is overall supportive of routine use of postplacental IUD placement and includes procedural information to lessen expulsion (Bartz & Pocius, 2019).

While the need and potential advantages are identified through expert opinion and clinical decision-making tools, barriers such as provider knowledge and misinformation on the intervention show a critical need for further critical review and synthesis of the currently available literature. Published Cochrane reviews previously identified that postplacental IUD insertion should be considered for women at risk for not attending postpartum care; however, the one-year continuation of postplacental IUD was not identifiable in these reviews (Lopez et al., 2015).

Significance to Nurse-Midwifery

Midwifery care is hallmarked by a dedication to both public health and ensuring equitable access to care (American College of Nurse-Midwives [ACNM], 2020). Knowing that competent midwifery care is fundamentally rooted in advocating for patients' right to self-determination and access to care as well as a dedication to evidence based care, nurse-midwives must take the time to familiarize themselves ways they may increase access to desired contraception in a timeframe that is most accessible to patients seeking contraception

postpartum. Nurse-midwives are the premier champions of autonomous client decisions and as such, should be interested in postplacental intrauterine device insertion if it is a viable way to increase access to desired family planning.

Theoretical Framework

The Health Belief Model (HBM) addresses the concerns of short interpregnancy intervals and supports finding a solution to avoid the morbidity and mortality associated with such intervals. The HBM originated as a 1950's U.S. Public Health disease prevention model to help the United States population avoid disease (LaMorte, 2019). One hallmark of the HBM is the reliance on an individual's desire to avoid illness, or in the case of interpregnancy interval inadequacy, an individual's realization that shortened intervals of pregnancy result in complicated maternal and fetal paths, and an individual seeking to mitigate and avoid that risk. In all, the HBM charges that an individual must believe that they are at risk, that the risk is significant, that any action taken to mitigate the risk is beneficial, that the obstacles are not so substantial that the action is unattainable, there is a cue to action, and that self-efficacy is present.

Looking specifically at short interpregnancy interval through the lens of the HBM, it is apparent that this model is an excellent theoretical framework for the issue. According to the World Health Organization (WHO), when the HBM was utilized during counseling sessions with patients, there were fewer unintended pregnancies even though both the HBM and control group had the same contraceptive use rate; this showed that both the education on adverse outcomes with unplanned and short interval pregnancy as well as the encouragement of decision ownership make the HBM the best framework to approach pregnancy prevention conversations (WHO, 2012).

While there are critics of the Health Belief Model and its potential incompleteness, it should be noted that healthcare theories merely provide a framework for meeting an actual person where they are and discovering intrinsic motivation. Historically, contraception decisions were made completely by the clinician with little patient autonomy, and as such, the HBM previously made little sense to frame contraceptive care. However, with the progression of patient autonomy and ownership of care, the evolution of contraception and prevention of adverse outcomes can transfer back to the patient through the HBM. Because of this evolution to a partnership of care from a paternalistic approach, even patients who are the most at-risk to leave care or become pregnant prior to return can be counseled to make this decision in an autonomous and health promoting manner (Hall, 2012). Rather than determining that this framework does not fit into family planning, providers should be challenged to make their dialogue fit a script that incorporates the HBM, knowing that such a model provides a path to a patient's desire to achieve health improvement.

Summary

In the United States, 33% of second order or greater pregnancies have a shortened interpregnancy interval of less than 18 months between the completion of one pregnancy and the incept of the next (ACOG, 2019). Paired with a nearly 50% unplanned pregnancy rate in the United States and abysmal maternal and neonatal morbidity and mortality, it is clear that intervention is necessary. One of the most autonomous ways an individual is able to directly influence their own pregnancy interval and health is through family planning. While an individual may have barriers to access care after leaving the hospital postpartum, postplacental IUD offering is one way to capture at-risk individuals and offer immediate contraception as an option for family planning. A critical review of the literature surrounding efficacy of method,

continuation of use, and barriers to facilitating postplacental IUD placement is a necessary step to exploring how to improve access to postplacental IUD insertion as an option for women desiring to avoid pregnancy in the postpartum period and beyond.

Chapter II: Methods

In order to critically evaluate the literature surrounding intrauterine device placement at the time of placental delivery, a comprehensive search was performed and was depicted utilizing a PRISMA flow diagram (see Figure 1). This chapter summarizes the search strategy including databases and search terms utilized, inclusion and exclusion criteria, and quality of literature. In order to fully appreciate literature surrounding postplacental intrauterine device placement, reference lists for each study meeting criteria were also evaluated for additional studies.

Search Strategy

In order to give full consideration of all available data for review and synthesis, both the advantages and disadvantages of postplacental intrauterine device placement were analyzed via multiple database searches through Cumulative Index to Nursing and Allied Health Literature (CINAHL), PubMed, and Scopus. Search terms for each database included immediate postpartum intrauterine device placement, postplacental LARC, postplacental IUD, postplacental Mirena, postplacental Paragard, postpartum IUD, postpartum IUD after vaginal delivery, IUD short interval pregnancy, barriers to postplacental LARC, and barriers to postplacental IUD placement.

Inclusion and Exclusion Criteria

Inclusion criteria required that articles be original research published in peer-reviewed journals that pertained to postplacental insertion of intrauterine devices, available in the English language, available in full text, and published after 2010.

Some articles were individually excluded for specific reasons including studies measuring irrelevant outcomes such as breastfeeding rate or male partner attitude towards postplacental insertion of device, study settings in low-income countries due to difficulties

monitoring continued use, rates of infection, and other complications, and studies that explored early contraception in general rather than specifically postplacental IUD placement.

Summary of Included Records

In total, 72 records were identified through these search terms with 37 remaining after removing duplicate records. The titles and abstracts of the remaining 37 articles were screened, resulting in 20 articles. Following a full-text review, 18 articles met the full criteria for inclusion in this synthesis (see Figure 1). There were five randomized controlled trials, five mixed methods studies, four retrospective cohort studies, three prospective cohort studies, and one quasi-experimental trial. In general, studies were not limited to comparing copper versus Mirena LNG-IUS use; however, one study specifically evaluated the difference in expulsion between these two types of devices. Fifteen of the studies were based in the United States, two studies were based in India, and one study was based in Turkey.

Criteria Used for Evaluating Literature

The Johns Hopkins Research Evidence Appraisal Tool was applied to each study individually to grade the evidence level for each record. This tool appraises articles in a three-tier evidence level category system, with level I being the most stringently designed and level III being non-experimental (Dang & Dearholt, 2018). Additionally, the tool evaluates the study quality as high, good, or low regarding the consistency of results. In total, there were five studies of level I evidence, six studies of level II evidence, and nine studies of level III evidence. This was expected as randomization of intrauterine device placement is unlikely. Additionally, twelve of the studies were of high quality, seven were of good quality, and one was of low quality. The low-quality study was rated as such because of because high attrition prevented research completion; however, the potential implications remain important to the discussion.

With the level of evidence for each record determined, a literature matrix was completed that synthesized the following for each study: source, level of evidence, purpose, study design, results, strengths and limitations, implications for current practice, and implications for future research (See Table 1).

Summary

In order to fully appreciate both the limitations and the efficacy of postplacental intrauterine device insertion, 18 total articles were synthesized and critically examined. Not only was device insertion compared to other postpartum time periods of insertion, but limitations of both provider skill and attitude, as well as system-wide limitations were evaluated as part of this critical literature review. In order to effectively and objectively assess each study, the Johns Hopkins Research Evidence Appraisal Tool was used to categorize each record. After limiting research pieces and evaluating the quality of each, individual matrices were completed to produce a concise and thorough compilation of valuable data from the literature.

Chapter III: Literature Review and Analysis

Synthesis of the Literature Matrix

The matrix contains 18 unique pieces of literature. Included in the matrix are five randomized controlled trials, five mixed methods studies, four retrospective cohort studies, three prospective cohort studies, and one quasi-experimental trial. An appraisal of each study was performed utilizing the Johns Hopkins Research Evidence Appraisal Tool (Dang & Dearholt, 2018). Key analysis of purpose, sample/setting, level and quality of evidence, design, results, and strengths and limitations of the study were critically evaluated and recorded on the literature matrix (see Table 1). Additionally, author recommendations and implications of the literature, as they relate to implementing postplacental IUD placement were also considered for each piece of literature.

Synthesis of Major Findings

The 18 peer-reviewed articles appraised support for postplacental intrauterine device placement as an appropriate contraception choice. Eleven of the articles included in the matrix critically assessed the continued use of intrauterine devices when placed postplacentally versus the traditional interval placement of 6 to 8 weeks postpartum or later. Additionally, there were three articles that assessed the qualitative opinions of clinicians regarding placing intrauterine devices within ten minutes of placental expulsion. There was one qualitative assessment of attitudes regarding postplacental IUD insertion from each U.S. state as well as policies that either facilitate or act as a barrier to the procedure. Finally, the remaining studies evaluated barriers to receiving intrauterine devices in the postpartum period after discharge from the delivery stay.

Evidence of Need

Rates of Intention of IUD Use Postpartum vs. Actual IUD Use Postpartum

Two studies in particular specifically evaluated the rates of receiving an intrauterine device (IUD) in the postpartum period when it was not offered prior to hospital discharge. Glazer et al. (2010) surveyed 175 women in the postpartum setting and performed a retrospective cohort study to assess the reality of postpartum contraception. This study concluded that education regarding contraception has little impact on the final percentage of counseled women receiving contraception postpartum. Seventy-seven percent of women surveyed reported discussing birth control prenatally and 87% reported discussing contraception postpartum. At six months postpartum, 22% of those desiring intrauterine devices for contraception were still awaiting placement. When asked, 62% of those women wished that postplacental insertion was an available option. Of the 175 women that participated in the study, 29% reported not using birth control at all at six months postpartum and 32% reported using a suboptimal contraceptive method (Glazer et al., 2010).

In a retrospective cohort study, Bergin et al. (2012) sampled 708 women requesting intrauterine device placement and the effect that a two-visit policy had on rate of successful insertion. While this study did not focus solely on the postpartum course, the findings are relevant as only 385 of the women requesting intrauterine device placement were able to have an IUD inserted (Bergin et al., 2012). These women also waited an average of 43 days before the subsequent visit for device placement could take place. Of the women requesting intrauterine devices for postpartum birth control, only 50% were actually able to have one placed while 60% of gynecologic patients received a device related to the women not attending the actual insertion appointment. The further away a patient's address was from the clinic location, the more likely

she was to miss attendance of her insertion appointment. Additionally, this study found that 96% of clinicians surveyed require a two-visit policy to insert an intrauterine device (Bergin et al., 2012).

Pregnancy Rates with Postplacental IUD Placement vs. Overall Repeat Pregnancy Rate in US

Cohen et al. (2016) evaluated the repeat pregnancy rate in a sample of 82 adolescent postpartum women aged 13 to 22 years old. During this prospective cohort study, women were given information about postplacental intrauterine device use and encouraged to choose a birth control method prior to giving birth. Eighty-two women elected to have post placental intrauterine device placement with 74 receiving the LNG-IUS and eight choosing a CuIUD. Fourteen percent requested discontinuation within the first year, along with a 25% expulsion rate; however, only one pregnancy resulted from expulsion. Only 7.6% of postplacental intrauterine device users were pregnant at one year postpartum compared to an average subsequent pregnancy rate of 21% for women aged 13 to 22 in the United States. Participants' two-year pregnancy rate was 8.1% compared to the national average of 46.5% and at three years, the subsequent pregnancy rate was 17.7% in participants using an intrauterine device from postplacental insertion compared to the national average of 83.7% in women ranging from 13 to 22 years of age (Cohen et al., 2016).

The studies included in this critical review demonstrated that prenatal education did not have a large effect on the rate of IUD insertion at the time of birth; however, an overwhelming number of women would have chosen to have a postplacental IUD given the long wait time they experienced postpartum for an IUD placement (Glazer et al., 2010). Additionally, current trends of practice requiring two-visits prior to insertion were found to be prohibitive for women to receive desired contraception. Clinic commuting distance was also a factor influencing women's

ability to return for IUD placement. Finally, the pregnancy rate of women who were given the opportunity to receive an IUD postplacentally versus the overall repeat pregnancy rate in the United States demonstrates a lowered repeat pregnancy rate in the postplacental IUD group.

Timing of Insertion

Expulsion

Three studies consistently showed a higher expulsion rate when intrauterine devices were placed immediately postplacentally versus the traditional interval of 6 to 8 weeks postpartum (Dahlke et al., 2011; Kumar et al., 2019; Shukla et al., 2012). The nadir of postplacental intrauterine device insertion was 7.5% in a large retrospective cohort study ($N = 673$) at a tertiary care center in India (Kumar et al., 2019). Shukla et al. (2012) performed a prospective cohort study of 1,317 women in an Indian tertiary care center, making it one of the largest sample sizes of postplacental intrauterine device insertion studies. In this large sample, the postplacental intrauterine device expulsion rate was 10.68% (Shukla et al., 2012). The rates of expulsion from postplacental insertion were as high as 27% in one study (Dahlke et al., 2011).

Continued Use

Even with higher rates of expulsion with insertions in the immediate postplacental period, continued rate of use was consistently as high or higher in those who received the device immediately after expulsion of the placenta (Chen et al., 2010; Crocket et al., 2017; Soon et al., 2018; Whitaker et al., 2014). Whitaker et al. (2014) performed a randomized controlled trial with participants randomized into immediate postplacental insertion of LNG-IUS (n = 20) versus a traditional 6-to-8-week postpartum insertion (n = 22). The rate of use was 60% at 12 months in the postplacental IUD (PPIUD) group and 40% in the interval placement group despite the expulsion rate being significantly higher ($p < .01$) in the PPIUD group (20%) compared to 0% in

the interval group (Whitaker et al., 2014). Similarly, in a study of 96 intrauterine device insertions (50 PPIUD, 46 at 6 to 8 weeks), Chen et al. (2010) found that expulsion was still higher in the postplacental cohort compared to the interval group; however, continued use at six months was the same.

In a small pilot study, Soon et al. (2018) randomized eleven adolescents into two groups, with six patients receiving a postplacental intrauterine device and five receiving a postpartum intrauterine device at 6 to 8 weeks postpartum. All six postplacental placements occurred; however, at 6 weeks postpartum, two of the five interval placements were not achieved due to fallout from postpartum care (Soon et al., 2018). At six months, four out of the six postplacental devices remained with one patient falling out of care and having an unknown status and one experiencing expulsion and not desiring a replacement device; however, zero of the postpartum devices remained. Two of the postpartum placements had since been removed and those adolescents were pregnant at the six-month evaluation (Soon et al., 2018).

Crockett et al. (2017) performed a multi-year retrospective study of 776 women and found that 7% of women receiving postplacental intrauterine devices requested removal by one year of use versus 14% of those receiving the device at 6- to 8-week postpartum visits. Multiple studies concluded similarly positive rates of use at three and six months as well as one year postpartum despite the significantly higher expulsion rates of postplacental intrauterine devices.

Pain During Insertion

Dahlke et al. (2011) determined that intrauterine devices placed within ten minutes of placental expulsion or within the 2 days postpartum had lower pain ratings than those placed in the interval placement period of 6 to 8 weeks postpartum. On a five-point visual analog pain scale, postplacental placement and extended postpartum placement participants rated the pain of

insertion as significantly lower (1.07 out of 5 and 1.93 out of 5 respectively), compared to interval placement participants (3.13 out of 5; $p < .001$), which was a statistically significant finding (Dahlke et al., 2011).

Factors Influencing Postplacental Intrauterine Device Expulsion

Through literature synthesis, several variables appeared to influence postplacental intrauterine device effectiveness and expulsion rates: type of intrauterine device, route of birth, and parity.

Type of Intrauterine Device

In a randomized controlled trial, Laporte et al. (2020) found that Mirena (LNG-IUS) was less likely to expel when placed postplacentally compared to the Paragard IUD. The study randomized women into two groups: those receiving a progesterone containing LNG-IUS postplacentally ($n = 70$) and those receiving a copper intrauterine device postplacentally ($n = 70$). Copper devices resulted in a higher expulsion rate (36.7%) compared to LNG-IUS (20%; $p = .12$), though this was a marginal effect (Laporte et al., 2020).

Route of Birth

One study in particular examine birth route as a factor in postplacental IUD expulsion rates (Colwill et al., 2018). A retrospective cohort study ($N = 169$) determined that retention of intrauterine devices placed postplacentally was higher in cesarean birth (100%) than when placed postplacentally after a vaginal delivery (84%) when assessed at 6 weeks postpartum ($p < .01$). This study did find that cesarean insertion more frequently required ultrasound to ensure that the device was still in place (Colwill et al., 2018). String visualization occurred 93.1% of the time with inspection after a vaginal delivery versus only 44.2% of the time after a cesarean delivery.

Sucak et al. (2015) found in a prospective cohort study ($N = 160$) that the presence of labor was a stronger predictor of expulsion than route of delivery. Vaginal deliveries experienced an 11.3% expulsion rate, whereas laboring cesareans experienced an 8.9% expulsion rate compared to the non-laboring cesarean expulsion rate of 6.5% at 6 months (Sucak et al., 2015). These studies determined a difference in expulsion rate when comparing birth routes. Nonlaboring cesarean sections maintained the lowest rate of expulsion while expulsion rates were higher for postplacental placements following a laboring cesarean or vaginal birth.

Parity

Two studies noted the increased risk of expulsion among multiparous women (Laporte et al., 2020; Sucak et al., 2015). Laporte et al. (2020) found that women delivering their third baby or greater were six times more likely to have a postplacental device expulsion. Similarly, a prospective cohort study in Ankara, Turkey ($N = 160$) found that multiparity had a twofold increase in expulsion and was the only independent factor for expulsion (Sucak et al., 2015).

Barriers to Providing Postplacental Intrauterine Device Insertion

Through a critical review of this literature, five studies were identified that evaluated provider, facility, and state regulations as barriers to offering and executing postplacental intrauterine device insertion.

Provider Attitude and Knowledge Gaps

Moniz et al. (2017) performed a survey of 4,609 certified midwives and certified nurse-midwives with a 17% response rate (n = 794). This survey revealed that only 10% of these midwives in the United States felt comfortable placing postplacental intrauterine devices. This study also showed that 64% of respondents wished they had education on postplacental intrauterine device use. Forty-one percent reported that this was not the standard of practice at

their facility, 27% felt unskilled in the insertion, 16.4% reported reimbursement concerns limiting implementation, and 8.4% avoided the practice related to expulsion or perforation concerns (Moniz et al., 2017).

Holland et al. (2015) performed a survey of 82 intrauterine device utilizing clinicians, both physician and nurse-midwife, and discovered that 42% of respondents reported placing a postpartum intrauterine device at least once. A lack of training was indicated as the most common reason for not placing postplacental intrauterine devices (73%). Sixty percent of respondents indicated they were uncomfortable with postplacental intrauterine device use, 43% appropriately identified the level of expulsion risk associated with the practice, and 25% incorrectly believed there was an increased risk of organ perforation when intrauterine devices are inserted in the postplacental period. Participants rarely felt that postplacental intrauterine devices should never be an option for contraception (1.2%) and some believed postplacental intrauterine device insertion should always be a contraception option (14.5%; Holland et al., 2015).

Provider Level of Education

Cole et al. (2019) performed a retrospective cohort study to examine 116 patient charts with postplacental intrauterine device insertion. This study found that postgraduate year-one obstetric residents did have a higher expulsion rate; however, they also had the lowest cesarean delivery rate. The researchers were unable to determine if years of education or route of delivery was the causative variable in expulsion. Reports from this study revealed that there was no expulsion rate difference by postgraduate year when vaginal deliveries were isolated for interpretation, meaning it is likely that years of education was not causative for expulsion but rather, the route of birth (Cole et al., 2019).

Jatlaoui et al. (2014) evaluated the expulsion rate in 100 participants for immediate postplacental intrauterine device insertion after vaginal delivery. While an 11% expulsion rate was present, no expulsion difference was found when separated by postgraduate year of residency.

These two studies had opposing results initially, but when both birth route and postgraduate year were considered together, the expulsion rate was the same across all postgraduate years.

Reimbursement and State Policies

Moniz et al. (2015) conducted telephone interviews with Medicaid agents representing 40 out of the 50 of the United States. Ten states declined participation. This endeavor revealed that 15 states covered postplacental intrauterine device insertion, nine were considering coverage, and 16 were not considering coverage (Moniz et al., 2015). Qualitative interviewing in the states that did cover postplacental intrauterine device insertion noted that device cost was far less than the cost of pregnancy care or long-term care of a child qualifying for Medicaid and improving maternal and child health was a priority. Those states not considering postplacental intrauterine device coverage cited lack of advocacy from community providers and immediate budget constraints as limiting factors (Moniz et al., 2015). Medicaid representatives that were in states favorable for the practice saw the short-term cost of IUD placement to be a long-term positive investment, whereas states not in favor of the practice either determined the device cost was too high or that providers in that particular state were not campaigning for device availability in the inpatient setting.

Strengths and Limitations of the Evaluated Literature

One strength of this literature review was the clear consensus drawn regarding expulsion rates and continuation of use. All studies consistently reported that postplacental intrauterine device placement resulted in a higher rate of expulsion than interval placement at 6 to 8 weeks; however, they also consistently showed that there was a similar or greater continued use of intrauterine devices when they were placed postplacentally (Chen et al., 2010; Crocket et al., 2017; Soon et al., 2018; Whitaker et al., 2014). The number of participants in each study was large enough to draw conclusions related to efficacy of postplacental IUD placement.

Poor participant retention did impact some studies' ability to draw statistically significant conclusions. This does, however, highlight the ongoing issue of losing contact with women postpartum, in both research as well as practice, and stresses the importance of providing contraception services in a timely manner.

One particular shortcoming of all of the studies is that none focused on consistency with placement technique with some utilizing ring forceps, others ultrasound guidance, and yet others using the included deploying device.

Summary

Through an in-depth analysis, the 18 studies included in this review all identified postplacental intrauterine device insertion as an acceptable, if not preferable, contraception method for women seeking contraception shortly after birth; however, as many as 60% of women who desired IUD placement were unable to seek subsequent care to have the IUD placed, leaving them with no or s contraceptive access.

Despite the increased risk for expulsion due to parity, labor, and vaginal birth, the continuation rate at one year was still comparable or higher for those who had their IUD placed

postplacentally compared with insertion at 6 to 8 weeks postpartum. Providers self-identified their own knowledge deficits as a barrier to initiating this practice. Additionally, states with little or no desire to reimburse for inpatient postplacental device insertion make the practice exceedingly difficult.

Chapter IV: Discussion, Implications, and Conclusions

This critical literature review was performed to assess both the advantages of postplacental intrauterine device insertion as well as barriers to its facilitation. In total, 18 research studies were analyzed to determine trends in research as well as gaps and implications to practice. These 18 studies were examined using the John Hopkins Research Evidence Appraisal Tool to determine data quality and evidence level.

Literature Synthesis

This literature review was founded on the research question "Is postplacental intrauterine device placement safe and effective; and if so, what are the barriers to implementing this practice?" During the literature synthesis, the consistent theme identified was that postplacental IUD placement did have a higher expulsion rate than traditional interval IUD placement; however, compared to those receiving interval placement, the overall use at one year was as high or higher in those receiving postplacental IUD placement (Chen et al., 2010). Furthermore, there was no difference in the safety risks associated with postplacental IUD placement compared to interval placement (Jatlaoui et al., 2014). Additionally, lack of funding as well as provider knowledge gaps were identified as main barriers to implementing the procedure (Holland et al., 2015; Moniz et al., 2015, 2017).

Trends and Gaps in Literature

Studies consistently demonstrated that postplacental IUD placement was just as safe as interval placement. While there were significantly more expulsions in the groups that received postplacental IUD placement, the overall use was as high or higher when compared to intended interval placement at 6 to 8 weeks postpartum. The lack of placement was typically attributed to patients being lost to follow-up to have the device placed. With as many as 40% of women not

returning for postpartum care following the birth of a child, this is an enormous care gap that needs to be addressed (The American College of Obstetricians and Gynecologists [ACOG], 2018). While this was often listed as a study limitation, this is simply more evidence that contraceptive offerings need to be established in the immediate postpartum period. Another trend that consistently appeared in the literature was small sample sizes overall. Again, this was frequently listed as a study limitation; however, with only 7.2% of all women aged 15 to 44 utilizing IUD contraception at any point, the population is extrapolated and expected to be small (Guttmacher Institute, 2020).

Provider Perception

Several studies looked specifically at provider training and its contribution to successful continued intrauterine device use (Cole et al., 2019; Sucak et al., 2015). There was no consistent outcome. One study did show that level of postgraduate education was associated with expulsion outcome but when birth route was isolated, expulsion rates were similar for all postgraduate levels (Cole et al., 2019). Multiple studies collected qualitative data from both physicians and advanced practice clinicians and several knowledge gaps regarding technique and identifying risk factors were identified (Moniz et al., 2017). The overall trend for providers was that they felt untrained in postplacental IUD placement. Moniz et al. (2017) found that providers consistently reported that they would likely offer postplacental IUD placement with more training or that they would like to offer the service; however, the facility did not have the ability to offer this service due to the inability to capture charges for the placement. Further study is required to determine provider role in both rate of use as well as barriers to facility implementation of the practice.

Patient Perspective

Only one study discussed the patient perspective on offering postplacental intrauterine device placement. Glazer et al. (2011) surveyed women that did receive postplacental IUD as well as those that were not able to have placement. Those that did receive a postplacental IUD were pleased with being able to obtain the contraception. Of the women still waiting placement at six months postpartum, an overwhelming majority (62%) wished they had been able to receive an IUD prior to leaving the hospital. Additionally, significantly less discomfort was reported with postplacental insertion versus traditional interval placement (Dahlke et al., 2011). Additional qualitative research is necessary to determine satisfaction, as most studies focused on efficacy. While one may assume satisfaction is related to continued use, that should be demonstrated statistically.

Cost as a Barrier

Few studies focused solely on barriers to instituting postplacental IUD placement. One study found that state Medicaid reimbursement was often associated with use of postplacental IUD (Moniz et al., 2015). Only 15 states in the United States currently have Medicaid coverage for inpatient IUD use. Device reimbursement is a barrier to implementation; however, it is only one layer of the barriers that exist and more studies, both qualitative and quantitative, must be conducted to identify all barriers and ways they may be eliminated.

Implications for Midwifery Practice

Even though postplacental IUD placement has been consistently demonstrated to be a safe and effective way to decrease unplanned pregnancy rates and in turn, increase the length of time between pregnancies, adoption of the practice is low. The two most common barriers to implementation are provider knowledge base and reimbursement. In a study performed by the

American College of Nurse-Midwives, only 10% of respondents felt comfortable placing a postplacental intrauterine device with 62% desiring training on the topic (Moniz et al., 2017). Given the Midwifery Hallmarks of both evidence-based care as well as the right to self-determination, nurse-midwives are poised to be the perfect lobbyists for postplacental IUD placements (ACNM, 2020). The evidence is clear that this procedure should be offered, particularly in populations at risk for loss of follow-up care. Additionally, patients' right to self-determination includes the ability to decide if and when a subsequent pregnancy should occur. With up to 40% of women never returning for postpartum care, a significant number of women continue life without the appropriate knowledge or tools to prevent unwanted pregnancy (ACOG, 2018). Postplacental IUD placement is a critical way for nurse-midwives to advocate for patients.

Surprisingly, prenatal education had little to do with ultimate choice of contraception. Glazer et al. (2011) corroborated previous studies that prenatal counseling did little to affect overall contraception use. Seventy-seven percent of respondents in this study recalled discussing IUDs in the prenatal period but reported that it had little to do with their decision (Glazer et al., 2011). While it is helpful to know that contraception education needs to be addressed differently or more frequently, there is a need for further research to determine the best way to address family planning in the prenatal and hospital postpartum course.

There is little additional training necessary for postplacental IUD placement. Cole et al. (2019) demonstrated adequate placement of postplacental IUD placement after a single email training was offered. Theoretically, offering a one-time in-service or virtual training should be sufficient to execute the practice in facilities. Equipped with the low-risk training investment and the evidence that this is a safe and preferred method of contraceptive offering, nurse-midwives

should feel empowered to offer this information to facilities to help create a more equitable family planning environment, particularly in populations at risk for loss of follow-up care in the postpartum period.

Beyond a willingness to receive training and individually adopt the practice of postplacental intrauterine device placement, Certified Nurse-Midwives (CNMs) are in an excellent position as patient advocates to campaign for more states to reimburse fairly for this procedure immediately postpartum. In addition to promoting adoption at the state and facility levels, CNMs should be looking for ways to spread accurate training regarding both the procedural technique and the safety and efficacy of the practice. Furthermore, nurse-midwives are able to increase incidence of use with thorough patient counseling regarding immediate contraceptive options throughout pregnancy and on arrival for birth.

Integrating the Health Belief Model (HBM)

The Health Belief Model (HBM) relies on an individual's desire to avoid illness, or in the case of postpartum family planning, subsequent pregnancy with its cascade of potential negative health and socioeconomic sequelae. The HBM trusts that individuals are given the knowledge that they are at risk for an adverse outcome and that certain actions to mitigate risks are seen as beneficial. One key aspect of the HBM is that actions are attainable and obstacles are not so great that manipulation is futile. In this case, knowing that 40% of women are unable to attend postpartum care visits demonstrates a need to remove barriers. Additionally, other barriers for those seeking care, such as the average 43-day delay between requesting an IUD and placement of a device, further decrease the number of women able to practice self-determination with family planning and prevent undesired pregnancy (Bergin et al., 2012). This prohibitive

environment makes postplacental IUD placement a valid solution to enabling women to mitigate risk.

Giving women information multiple times prenatally and on admission for birth allows women to take ownership of their fertility, particularly when paired with education about risks of shortened interpregnancy interval. Utilizing the Health Belief Model and knowing the risks of unwanted pregnancy and potential expulsion of a postplacental intrauterine device, it is likely that many women, feeling ownership and empowerment, would elect to have an IUD placed and return for potential expulsion.

Conclusion

This critical literature review consistently found that postplacental intrauterine device placement is a valid option for women seeking immediate contraception post birth or those women at risk for not attending postpartum care. Several studies concluded that postplacental IUD placement should even be a preferred contraceptive offering for those populations at risk to not return for postpartum care after leaving the birthing facility. In total, 18 research studies were evaluated utilizing the Johns Hopkins Research Evidence Appraisal Tool with pertinent findings related to device expulsion, safety, continued use at time intervals such as three months, six months, and one year, provider knowledge gaps, variable state insurance practices, and patient perceptions. Identified barriers came from state reimbursement issues and provider knowledge gaps. While factors facilitating implementation of this procedure were not specifically studied, locations with access to the devices in the inpatient obstetric setting were most likely to be able to employ the technique.

Nurse-midwives are in a pivotal role with regards to promoting use of postplacental IUD placement. The unique hallmarks that guide the profession combined with utilizing the Health

Belief Model are perfectly aligned to encourage this practice be initiated to allow for evidence-based care and patient right to self-determination. Time spent counseling women during the prenatal and birthing periods allows for adjustments to education to ensure that women are able to make informed choices either prenatally or at the time of admission for birth. With the overwhelming evidence of its safety and efficacy, postplacental intrauterine device insertion is one critical way that nurse-midwives can positively impact the rate of unplanned pregnancy and shortened interpregnancy interval in the United States.

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Figure 1. PRISMA Flow Diagram

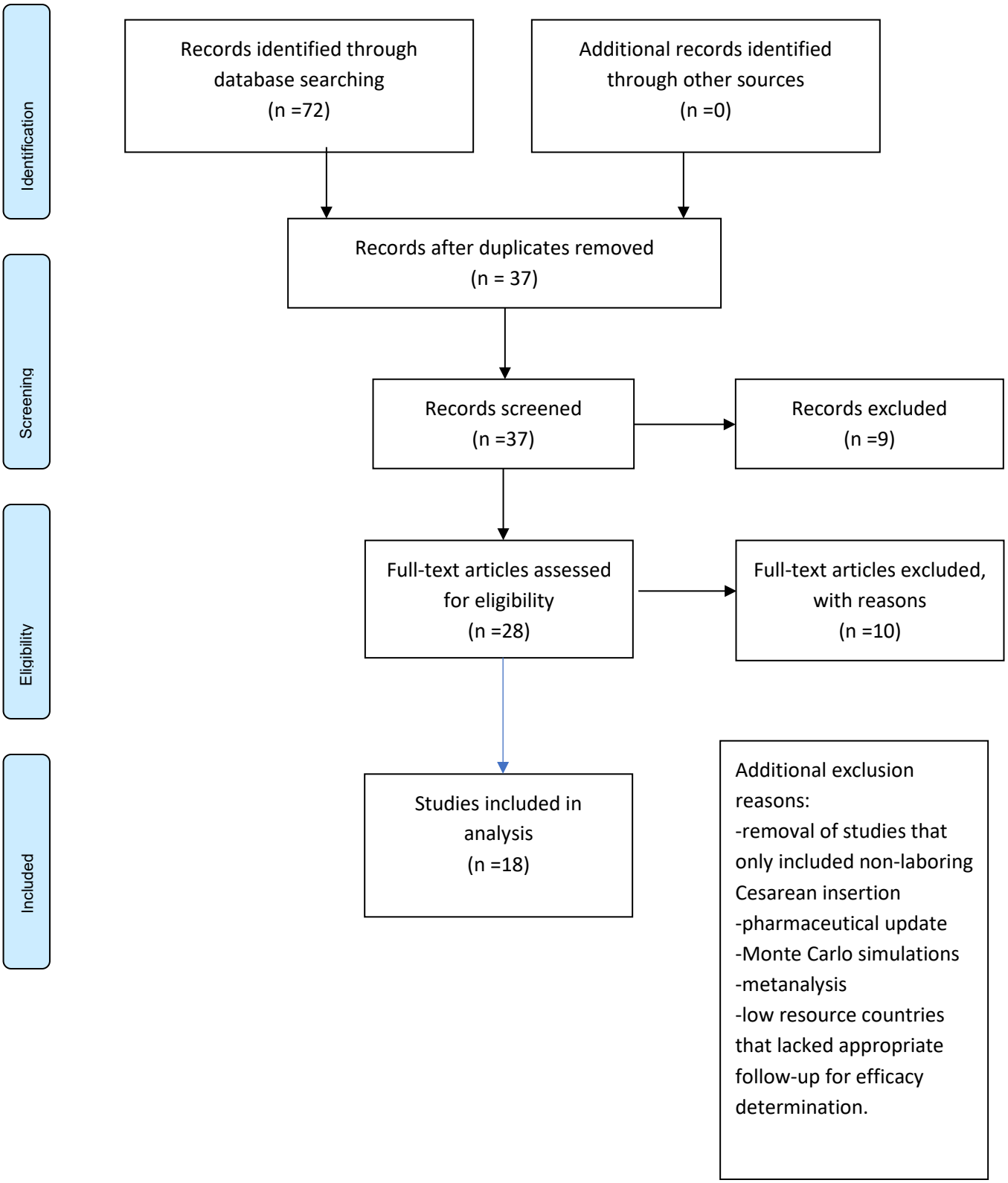

Table 1. Literature Review Matrix

Source: Bergin, A., Tristan, S., Terplan, M., Gilliam, M. L., & Whitaker, A. K. (2012). A missed opportunity for care: Two-visit IUD insertion protocols inhibit placement. *Contraception*, *86*(6), 694–697. https://doi.org/10.1016/j.contraception.2012.05.011			
Purpose/Sample	**Design (Method/Instruments)**	**Results**	**Strengths/Limitations**
Purpose: Examine the potential for two visit IUD process to limit access to birth control **Sample/Setting:** 708 women requesting IUD in a primarily low income clinic with a mostly Medicaid insured population in an urban university medical center **Level of evidence:** II **Quality of evidence:** High	Retrospective study Study examined 708 women who requested IUD over a one year period. A two visit IUD policy was initiated, requiring one visit to request an IUD and a second one 2-3 weeks later for placement. Retrospective review of orders and paper charts was utilized to determine rate at which women actually obtained IUD.	Of the 708 women requesting IUD, only 385 were actually able to return for placement with a median wait of 43 days between appointments. 50% of women requesting IUD at pregnancy related visits returned for placement and 60% of women requesting at GYN visits returned. Single women were less likely to return than married women. Race, age, and type of IUD did not have an impact. **Conclusion:** Two-visit IUD placement is prohibitive to desired contraception.	**Strengths:** -Because women were IL Medicaid, they could not attempt placement at a different provider as the state only allows one order. -Large sample size. **Limitations:** Utilizing medical billing records limited statistics that could be assessed. -Unable to determine reason for nonplacement based on retrospective nature. -Limited population diversity. -No comparison to rate with single visit placement.
Author Recommendations: Single visit IUD placement significantly increases rate of use.			
Implications: Postpartum women only have desired postpartum IUD placed at a 50% rate in the outpatient setting. 96% of clinicians report a 2 visit policy related to insurance, further limiting options for women. An average of 43 days passed between being able to request an IUD and have one placed.			

Source: Chen, B. A., Reeves, M. F., Hayes, J. L., Hohmann, H. L., Perriera, L. K., & Creinin, M. D. (2010). Postplacental or delayed insertion of the levonorgestrel intrauterine device after vaginal delivery: a randomized controlled trial. *Obstetrics and Gynecology*, *116*(5), 1079–1087. doi:10.1097/AOG.0b013e3181f73fac

Purpose/Sample	**Design (Method/Instruments)**	**Results**	**Strengths/Limitations**
Purpose: Compare use of LNG-IUS at 6 months postpartum when placed postplacentally vs. delayed insertion. **Sample/Setting:** 50 postplacental placement 46 delayed until 6-8 weeks placement **Johns Hopkins Evidence Appraisal Strength:** I **Quality:** Good	Prospective cohort study Pregnant women that desires LNG-IUS were randomly assigned at the time of labor to either immediate postplacental IUD placement or traditional 6-8 week postpartum IUD placement with expelled IUDs replaced if patients requested. Disqualifiers were intrapartum hemorrhage or infections, as well as cesarean. Phone surveys performed at 3 and 6 months post-placement.	**Conclusion:** At six months, use was similar in both groups. Even though expulsion was significant higher in the immediate group, women sought care for replacement. This paired with women being less likely to follow-up postpartum and request an LNG-IUS accounts for the similar use in both populations.	**Strengths:** Random assignment into group of women all desiring LARC prevented inadvertent bias coming from the sample. Scrupulous removal of women not meeting criteria allowed for good internal validity. **Limitations:** Limitations included inconsistent insertion techniques and skill level.

Author Recommendations:
Offer postplacental LNG-IUS in populations at risk to not seek delayed insertion. US for high fundal placement to avoid complications of expulsion seen in study.

Implications: Placing IUDs immediately post placentally is similarly effective to that of the traditional last visit of a postpartum course at six to eight weeks postpartum. Even though the rate of use at six months is similar, postplacental IUD placement had an expulsion rate of 24% compared to the 6-8 week placements. Because of this postplacental IUD insertion should be considered in populations where postpartum visit attendance is low. If the likelihood of attending postpartum appointment at 6-8 weeks is high, reserve placement for then.

Source: Cohen, R., Sheeder, J., Arango, N., Teal, S. B., & Tocce, K. (2016). Twelve-month contraceptive continuation and repeat pregnancy among young mothers choosing postdelivery contraceptive implants or postplacental intrauterine devices. *Contraception*, *93*(2), 178–183. https://doi.org/10.1016/j.contraception.2015.10.001

Purpose/Sample	**Design (Method/Instruments)**	**Results**	**Strengths/Limitations**
Purpose: To determine one year continuation and repeat pregnancy rate with postplacental IUD (PPIUD) **Sample/Setting:** 82 13-22 year old women receiving LNG-IUS (n = 74) and CuIUD (n = 8) at Children's Hospital Colorado. **Level of evidence:** II **Quality of evidence:** High	Prospective Cohort Study Women were given PPIUD information in the second trimester and all women through CAMP were encouraged to choose a method of birth control prior to birth. Those that chose PPIUD were included in this study. Records were reviewed at 6 and 12 months postpartum to determine IUD continuation and pregnancy rate.	14% requested discontinuation within the first year. 25% experienced expulsion. 94% of expulsions were within 12 weeks PP. PP with 15/17 expulsions recognized by participant. 7.6 pregnancy rate at one year. 1 pregnancy from expulsion and rest were from requested removal and no reliable contraception. **Conclusion:** Continued use of IUD at one year was high. and even though expulsion was higher than baseline IUD expulsion, overall use at one year is similar. Also, pregnancy rate extensively lower than general pregnancy rate for women 13-22 years old.	**Strengths:** -All patients included desired the type of contraception they received, therefore motivation for success allowed for best case results. -Prospective non-randomization. -Excellent follow-up database for completeness of results. **Limitations:** - Convenience sampling vs. large scale randomized population - Sample limited to younger patients

Author Recommendations: Providers can recommend PPIUD for short interpregnancy interval pregnancy prevention; however, because of increased expulsion rates, follow-up should be emphasized.

Implications: Only 7.6% of participants were pregnant at one year compared to the average of 21% in the U.S. Participants had 2 year pregnancy 8.1 and 3 year 17.7 vs non-LARC CAMP participants having a 2 year pregnancy rate of 46.5% and 83.7% at 3 years.

Source: Cole, M., Thomas, S., Mercer, B. M., & Arora, K. (2019). Impact of training level on postplacental levonorgestrel 52 mg intrauterine device expulsion. *Contraception*, *99*(2), 94–97. https://doi.org/10.1016/j.contraception.2018.11.003			
Purpose/Sample	**Design (Method/Instruments)**	**Results**	**Strengths/Limitations**
Purpose: Evaluation of correlation between expulsion of PPIUD and PGY level **Sample/Setting:** 116 patients with PPIUD at a single facility Cleveland, OH. **Level of evidence:** Level II **Quality of evidence:** Good	Retrospective Cohort Study Chart review of insertion and clinical outcome of 116 patients receiving PPIUD following a single email training of insertion provided to providers.	1506 deliveries in six months with 116 receiving PPIUD (7.7% of births) with 75% continued use at 6 months. 101 placed manually, 8 placed with ring forceps, 6 with inserter. Only 2 used ultrasound. Using the inserter resulted in no expulsion and forceps the highest. PGY was not correlated to expulsion in VD. **Conclusion:** PPIUD retention is affected by provider training level and route of delivery but unclear which one is the meaningful factor.	**Strengths:** Retrospective study allowed comprehensive review of pertinent information without having concern of fallout from study **Limitations:** -Varied methods of insertion -Limited population receiving PPIUD -One facility results - Based on limited education re: insertion - Appx 75% follow-up availability -Single type of IUD
Author Recommendations: More evaluation to determine route of delivery, provider level of expertise, and method of insertion to examine which is the causative reason for increased expulsion; larger sample sizes in future studies. More training provided and then reevaluate if PGY level was correlated to expulsion.			
Implications: Skill level of provider may indicate likelihood of expulsion, though later studies indicated that explicit and comprehensive training may make the larger difference.			

<table>
<tr><td colspan="4">Source: Colwill, A., Schreiber, C., Sammel, M., & Sonalker, S. (2018, March). Six-week retention after postplacental copper intrauterine device placement. Contraception, 97(3), 215-218. https://doi.org/10.1016/j.contraception.2017.10.012</td></tr>
<tr><td>Purpose/Sample</td><td>Design (Method/Instruments)</td><td>Results</td><td>Strengths/Limitations</td></tr>
<tr><td>Purpose: To evaluate retention and complications of CuIUD use at 6 weeks postpartum when IUD was placed immediately postplacental.

Sample/Setting: 169 women delivering at Hospital of the University of Pennsylvania

Level of Evidence: III

Quality: Good</td><td>Retrospective Cohort Study

Retrospective data collection of copper IUDs placed within ten minutes of placenta removal. 137 vaginal deliveries were evaluated and 73 cesarean deliveries were evaluated. Retention and complication data was recorded.</td><td>Conclusion:
Cesarean deliveries had a higher retention rate than vaginal deliveries at six weeks (100% vs. 84%, p = .01); however cesarean delivery resulted in higher rates of more significant evaluation of IUD placement like ultrasonography than post vaginal delivery placement because strings were visible more often in vaginal delivery placements (93.1% vs. 44.2%)</td><td>Strengths: Strengths of study include the comprehensive documentation of clinical practice outcomes.

Limitations:
- 20% of women were lost to follow-up when reviewing the postnatal records due to retrospective aspect of the study.
- Limited to copper IUD only, no LNG-IUS considered.</td></tr>
<tr><td colspan="4">Author Recommendations:
This author recommends studying the clinical significance of PPIUD expulsion further.</td></tr>
<tr><td colspan="4">Implications: PPIUD should be considered a viable contraceptive method, particularly if postpartum insurance coverage is lacking or risk of loss of follow-up shows need to capture women at the time of birth for contraceptive offering.</td></tr>
</table>

Source: Crockett, A. H., Pickell, L., Heberlein, E. C., Billings, D. L., & Mills, B. (2017). Six- and twelve-month documented removal rates among women electing postpartum inpatient compared to delayed or interval contraceptive implant insertions after Medicaid payment reform. *Contraception*, *95*(1), 71–76. https://doi.org/10.1016/j.contraception.2016.07.004

Purpose/Sample	**Design (Method/Instruments)**	**Results**	**Strengths/Limitations**
Purpose: To evaluate removal rates of women receiving PPIUD vs. interval IUD placement. **Sample/Setting:** 776 Medicaid-enrolled women at a regional perinatal care center in upstate SC. **Level of evidence:** I **Quality of evidence:** High	Retrospective study of 776 women using medical record review. Women all received LNG-IUS from 7/2007-6/2014. Comparison of rate and reason for removal at 6 months and 12 months for both PPIUD and interval IUD placement.	4% total from both groups reported removal with no statistical difference between the two groups at 6 months. At 12 months, 12% total women reported removal. 7% of PPIUD reported removal at 12 months vs. 14% of outpatient inserts. **Conclusion:** In a setting that Medicaid pays for LARC, less women removed LNG-IUS devices than their outpatient counterparts.	**Strengths:** Because of the population studied, cost and availability did not limit women that otherwise wished to have the device placed. **Limitations:** Only studied Medicaid population in a state that had coverage of the device. May not be relevant for other populations.

Author Recommendations: Medicaid and insurance payment policies that remove institutional barriers to PPIUD LARC may optimize family planning desires.

Implications: Most studies focus on inadvertent expulsion; however, this study focused on elective removal, which was less in PPIUD placements.

Source: Dahlke, J. D., Terpstra, E. R., Ramseyer, A. M., Busch, J. M., Rieg, T., & Magann, E. F. (2011). Postpartum insertion of levonorgestrel–intrauterine system at three time periods: A prospective randomized pilot study. *Contraception*, *84*(3), 244–248. https://doi.org/10.1016/j.contraception.2011.01.007

Purpose/Sample	**Design (Method/Instruments)**	**Results**	**Strengths/Limitations**
Purpose: To determine efficacy of LNG-IUS placement at three different intervals. **Sample/Setting:** 46 women in the Naval Medical Center at Portsmouth between Aug 2009 and Jan 2010. -15 PPIUD insertion -15 for >10 minute but <48 hour -16 delayed insertion 6 weeks **Level of evidence:** Level II **Quality of evidence:** Good	Randomized controlled trial 53 women desired Mirena birth control and were randomized into three arms—10 minutes postplacental, between 10 minutes and 48 hours post-delivery, and at 6 week postpartum visit. The method of insertion was standardized and post insertion questions regarding satisfaction were at 3 and 6 months postpartum.	Use at 6 months was comparable in all arms: 93% IPP, 87% EP, 94% INT Though there was a higher rate of expulsion in the PPIUD arm (27%), many of these participants returned to care for replacement, making IUD usage comparable across the three arms at 3 and 6 months. The PPIUD arm rated pain significantly less than the other two groups using a visual analog scale (1-5 with 5 being most painful). IPP and EP had a scale of 1.07 and 1.93 respectively while INT had a VAS of 3.13 with a p = <.001.	**Strengths:** -3 arms of randomization -Federal facility without insurance and infrastructure constraints **Limitations:** -Small sample -Sample limited to military insured patients without insurance limitations

Author Recommendations:
Future research should include larger sample size and various ways to ensure patient follow-up.

Implications: Immediate postplacental LNG-IUS insertion showed a 27% expulsion rate compared to 5-6% in the 6 week postpartum group. Even with this considered, continued use at both three and six months was virtually the same in all three arms given that those that had expelled IUDs did have them reinserted. Additionally, pain during and after insertion was significantly less when placed immediately postplacentally.

Source: Glazer, A. B., Wolf, A., & Gorby, N. (2011). Postpartum contraception: Needs vs. reality. *Contraception*, *83*(3), 238–241. https://doi.org/10.1016/j.contraception.2010.07.002

Purpose/Sample	**Design (Method/Instruments)**	**Results**	**Strengths/Limitations**
Purpose: To determine whether patient education about contraception had an effect on use of contraception and attitude towards postplacental IUD offering. **Sample/Setting:** 175 postpartum women in an urban setting in US **Level of evidence:** Level III **Quality of evidence:** High	Retrospective Cohort Study Written surveys were issued to women postpartum prior to discharge from delivery stay to evaluate recollection of discussing contraception both prenatally and in the office. Written surveys were also mailed at 4 and 6 months postpartum to evaluate use of contraception and appeal of a postplacental IUD offering.	77% women recall discussing birth control prenatally and 87% postpartum. 30% report conversation about IUD prenatally and 31% in hospital. 23% report that they would have liked the option to have an IUD placed postplacentally. 5% of participants were using IUD at 6 months PP with 22% still awaiting placement. Of those 22%, 62% would have elected to have postplacental placement if offered. 29% report not using birth control at 6 months and 32% report using suboptimal birth control. **Conclusion:** Contraception education does not have a great impact on contraceptive use. Offering postplacental IUD may improve contraceptive use.	**Strengths:** Diverse sample of participants Good capture of quantitative data. **Limitations:** -Low retention rate

Author Recommendations: While this study corroborates previous limited studies about the lack of effect counseling has on contraceptive use, more studies are needed to determine the optimal way to encourage use of contraception.

Implications: Prenatal counseling did not have a large effect on use of contraception. Many women that desire IUD postpartum are left to wait for placement. Of those waiting, a majority would have preferred a postplacental option.

Source: Holland, E., Michelis, L., Sonalkar, S., & Curry, C. L. (2015). Barriers to immediate post-placental intrauterine devices among attending level educators. *Women's Health Issues*, *25*(4), 355–358. https://doi.org/10.1016/j.whi.2015.03.013

Purpose/Sample	**Design (Method/Instruments)**	**Results**	**Strengths/Limitations**
Purpose: To evaluate barriers to placing PPIUD for providers **Sample/Setting:** 82 CNM and physicians **Level of evidence:** III **Quality of evidence:** High	Qualitative Survey Online survey sent to OB providers at seven different facilities, assessing knowledge, training, and experience.	42% reported placing a PPIUD. Most common reason for not placing included: lack of training (73%), uncomfortable (60%), not available at facility (50%). 43% appropriately identified expulsion risk. 25% inappropriately believed increased perforation risk was present. 8% believed increased infection risk. 1.2% never an option to place PPIUD, 14.5% always an option **Conclusion:** Most providers reported PPIUD acceptable at least some of the time (85%) although there were knowledge gaps on risks and providers IDed need for training and availability within facility.	**Strengths:** -Breadth of providers (OBGYN, FP, CNM), --Participant anonymity allows for more honest response **Limitations:** Each institution likely did not survey every provider -No direct communication with participants, Because the survey was likely forwarded, there is no way to know response rate. - No specifics of when a provider would utilize PPIUD. -Stratification by facility was uneven r/t voluntary response.

Author Recommendations: Comprehensive surveying of all providers vs. facility targeted choices. This survey was disseminated in a non-controlled manner and all providers should have opportunity to respond. This survey is enough evidence to push for amendment of Medicaid policy to positively affect reimbursement—one of the bigger barriers to implementation. Training and facility policy changes are also required.

Implications: Although the risk of expulsion is high, the overall benefit of PPIUD to decrease unintended short interpregnancy interval is greater. Acceptance of practice high but knowledge and practical application of skill/service is low.

Source: Jatlaoui, T. C., Marcus, M., Jamieson, D. J., Goedken, P., & Cwiak, C. (2014). Postplacental intrauterine device insertion at a teaching hospital. *Contraception*, *89*(6), 528–533. https://doi.org/10.1016/j.contraception.2013.10.008

Purpose/Sample	**Design (Method/Instruments)**	**Results**	**Strengths/Limitations**
Purpose: To evaluate the effectiveness and safety of PPIUD in a teaching facility, particularly in non-expert clinicians **Sample/Setting:** 100 participants desiring PPIUD at Emory Hospital, Atlanta, GA **Level of evidence:** II **Quality of evidence:** High	Prospective cohort study Women able to choose this contraception option prior to delivery. A one-time training was provided to obstetric residents with refreshers every six weeks. Ultrasound and ring forceps were used each time. 4 week, 6 week visits established placement and satisfaction. 3 month and 6 month surveys evaluated satisfaction and continued use.	88% of participants able to be contacted for a 19% expulsion rate. Zero pregnancies or perforations. 11% infection rate. No expulsion difference in PGY years; biggest difference was parity with multiparous women accounting for the vast majority of expulsion; only one prime expulsion. **Conclusion:** PPIUD is both safe and effective; additionally, level of training had no implication to efficacy. High infection rate is similar to non-PPIUD insertion infection rate, which is high in Fulton Co, GA.	**Strengths:** -Ability to demonstrate a standardized and efficient provider training model -Adequate follow-up. **Limitations:** -Smaller -Limited population demographics.

Author Recommendations: PPIUD can be safely initiated even with no prior experience with PPIUD insertion and may positively impact unintended pregnancy rate, especially for those otherwise at risk for non-return to postpartum care. The lack of increased expulsion by lower experienced clinicians is in contrast to previous literature.

Further studies in expulsion related to parity or anesthesia needed.

Implications: This study showed safe and effective use of PPIUD resulted in zero pregnancies at 6 months regardless of increased expulsion rate. Initiating basic standardized training for PPIUD and making this an available practice will increase contraceptive use and decrease unintended pregnancy.

<table>
<tr><td colspan="4">Source: Kumar, S., Srivastava, A., Sharma, S., Yadav, V., Mittal, A., Kim, Y., Nash-Mercado, A., Reijneveld, S. A., & Sood, B. (2019). One-year continuation of postpartum intrauterine contraceptive device: Findings from a retrospective cohort study in India. Contraception, 99(4), 212–216. https://doi.org/p</td></tr>
<tr><td>Purpose/Sample</td><td>Design (Method/Instruments)</td><td>Results</td><td>Strengths/Limitations</td></tr>
<tr><td>Purpose:
To evaluate use of immediate postpartum CuIUD use at one year

Sample/Setting:
673 randomly selected women in India

Level of evidence:
III

Quality of evidence:
High</td><td>Retrospective Cohort

Telephone survey at one year postpartum to determine IUD use, symptoms, and alternative contraception</td><td>673 of the women had PPIUD placement, 62% reported continued use, 7.5% reported expulsion, 19.3% removal for menorrhagia. 50% did not switch to a different method.

Conclusion:
Use at one year was 62%. Reason for non-use at one year was more related to side effects like bleeding than expulsion.</td><td>Strengths:
Large sample size with good follow-up

Limitations:
-Only one type of IUD used (CuIUD)
-Population homogeneous.</td></tr>
<tr><td colspan="4">Author Recommendations: Future studies need to focus on the lack of having an alternative method of contraception.</td></tr>
<tr><td colspan="4">Implications: Expulsion was low. Because removal was often for CuIUD known side effects, results may be different with an LNG-IUS</td></tr>
</table>

Source: Laporte, M., Marangoni, M., Surita, F., Juliato, C. T., Miadaira, M., & Bahamondes, L. (2020). Postplacental placement of intrauterine devices: A randomized clinical trial. *Contraception*, *101*(3), 153–158. https://doi.org/10.1016/j.contraception.2019.12.006			
Purpose/Sample	**Design (Method/Instruments)**	**Results**	**Strengths/Limitations**
Purpose: To compare the use of CuIUD versus LNG-IUS at 90 days when placed postplacentally. **Sample/Setting:** 140 women, 70 LNG-IUS and 70 Copper IUD received postplacental IUD placement in Brazil **Level of evidence:** Level I **Quality of evidence:** High	Randomized controlled trial 140 women were enrolled to receive a postplacental IUD placement (half LNG-IUS, half TCu380A) regardless of method of delivery. Women were randomized into type of IUD received. Follow-up was performed for verification of placement at 42 and 90 days post birth.	22/60 (36.7%) expelled copper IUD. 12/60 (20%) expelled LNG-IUS ($p = 0.12$). Higher expulsion in vaginal delivery and women on their third or greater birth. 33/34 (97%) expulsions occurred by the 42 day visit. **Conclusion:** PPIUD expulsion was higher in copper CuIUD use, vaginal delivery, and women with three or more deliveries. Nearly all occurred in the first six weeks postpartum.	**Strengths:** -Sample randomization -Ultrasonography allowed for more complete assessment -Good sample retention **Limitations:** -Imbalanced parity and age No continuous surveillance to ascertain the exact time of expulsion (just <6 weeks postpartum). -Short follow-up timeframe
Author Recommendations: Recommendations include future studies to focus on type of device, delivery, and technique for more trending. Additionally, in practice because most of the expulsions were in the first six weeks postpartum, particular care to surveilling for expulsion should be taken during this time to prevent unwanted pregnancy or other complications.			
Implications: LNG-IUS systems may be a more effective device for PPIUD insertion than Cu devices. Additionally, most expulsion occurred in the first 6 weeks postpartum.			

Source: Moniz, M. H., Dalton, V. K., Davis, M. M., Forman, J., Iott, B., Landgraf, J., & Chang, T. (2015). Characterization of medicaid policy for immediate postpartum contraception. *Contraception*, *92*(6), 523–531. https://doi.org/10.1016/j.contraception.2015.09.014

Purpose/Sample	**Design (Method/Instruments)**	**Results**	**Strengths/Limitations**
Purpose: Identify which states offer PPIUD reimbursement and potential barriers to PPIUD **Sample/Setting:** Representatives from 40 Medicaid agencies **Level of evidence:** III **Quality of evidence:** Good	Qualitative Study Telephone interviews with 40 representatives of Medicaid agencies to determine trends in reimbursement and policy barriers	15 states covered PPIUD; 9 considering PPIUD coverage; 16 not considering coverage. States providing coverage stated improving overall maternal and child health as well as overall cost savings as reason. States declining to cover stated lack of advocacy from community providers and immediate budget constraints to be the rationale for not covering. **Conclusion:** Many states provide Medicaid coverage of immediate PP LARC. Misinformation about clinical effects and cost-effectiveness promote moving to PPIUD insertion.	**Strengths:** Direct communication with policy making agencies. **Limitations:** -Not all states in the United States elected to participate. 20% missing. -Reimbursement is only one layer of the barriers that exist with PPIUD.

Author Recommendations: Addressing misinformation about PPIUD insertion and recognizing long-term cost savings are ways to eliminate barriers from PPIUD insertion.

Implications: 15 states in the US cover PPIUD insertion at the time of birth. Of those that don't, misinformation, initial cost, and lack of provider desire are the common reasons for omitting this option.

Source: Moniz, M. H., Roosevelt, L., Crissman, H. P., Kobernik, E. K., Dalton, V. K., Heisler, M. H., & Low, L. (2017). Immediate postpartum contraception: A survey needs assessment of a national sample of midwives. *Journal of Midwifery & Women's Health*, *62*(5), 538–544. https://doi.org/10.1111/jmwh.12653

Purpose/Sample	**Design (Method/Instruments)**	**Results**	**Strengths/Limitations**
Purpose: To determine CNM and CM perceptions on PPIUD barriers, knowledge, and current practice **Sample/Setting:** 4609 CM and CNM invited to survey with a 794 (17%) rate of response; 99% female; 92% white; 45% practicing in an urban setting **Level of evidence:** Level III **Quality of evidence:** High	Qualitative Survey Study Online survey discussing barriers of PPIUD, current practice, knowledge deficit, and desires for further training.	10% felt comfortable placing a PPIUD; 64% wished to have training on method; 20% reported access to this training; 41% reported barrier is not standard practice; 27% stated not available; 27% stated inadequate skill; 16.4% were concerned about reimbursement; 8.4% concerned about perforation or expulsion. **Conclusion:** 90% of midwives reported not feeling comfortable with PPIUD insertion but 64% would like to learn more; there is a significant education gap.	**Strengths:** Large scale assessment of barriers, anonymous, accessible survey **Limitations:** -Low response rate -Self-reporting -May not be accurately able to translate to larger??

Author Recommendations:
This study identified a need to assess for didactic and skill training as well as a need to evaluate barriers in depth such as facility inability to stock IUD for placement and social bias against placement.

Implications: Common barriers such as lack of training, lack of availability, reimbursement concerns, and misunderstanding of complication risks were identified by a large sample of midwives, highlighting the need for didactic training on the subject.

Source: Shukla, M., Qureshi, S., & Chandrawati. (2012). Post-placental intrauterine device insertion-a five year experience at a tertiary care centre in north India. *Indian Journal of Medical Research*, *136*(3), 432–435.			
Purpose/Sample	**Design (Method/Instruments)**	**Results**	**Strengths/Limitations**
Purpose: To determine the long-term safety and efficacy of PPIUD insertion **Sample/Setting:** 1317 women in a north Indian tertiary care center **Level of evidence:** III **Quality of evidence:** High	Prospective cohort study CuIUD was inserted within ten minutes of placental delivery. Follow-up with physical exam and survey at 6 weeks and 6 months postpartum.	1317 women had IUD placed postplacentally. 280 did not return for follow-up. Expulsion rate at 6 months was 10.68%. 0% perforation. 0% PID **Conclusion:** PPIUD insertion is safe and effective; particularly in those at risk for loss from postpartum care.	**Strengths:** -Large sample size. -Adequate follow-up at least the 6 week visit **Limitations:** -Loss to follow-up at 6 months (22%) -No follow-up past six months. -Only CuIUD evaluated.
Author Recommendations: Future research should include larger scale study, following patients for one year or greater to determine efficacy.			

Source: Soon, R., McGuire, K., Salcedo, J., & Kaneshiro, B. (2018). Immediate versus delayed insertion of the levonorgestrel intrauterine device in postpartum adolescents: A randomized pilot study. *Hawaii Journal of Medicine and Public Health*, *77*(3), 60–65. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5845021/

Purpose/Sample	**Design (Method/Instruments)**	**Results**	**Strengths/Limitations**
Purpose: To evaluate the feasibility of a larger scale study evaluating adolescents using IUD at 6 months when placed postplacental vs. postpartum **Sample/Setting:** 11 adolescents; 6 receiving postplacental IUD and 5 receiving postpartum IUD **Level of evidence:** Level II **Quality of evidence:** Good	Randomized Control Trial 11 adolescents were randomized into immediate postplacental IUD insertion within 10 minutes of placenta (using hand to fundus or ring forceps) or 6-8 weeks postpartum IUD placement. Follow-up was at 6 weeks postpartum, 10 weeks postpartum, and 6 months postpartum. Evaluation included pain, bleeding, satisfaction, and rate of IUD use.	All 6 postplacental placements occurred. At six weeks 2 of the 5 postpartum IUDs occurred because of loss to follow-up, pregnancy, or no longer desiring IUD. At 6 months, 4/6 postplacental IUDs remained with one non-replacement and one falling out of study. 0 of the 5 postpartum placements had IUD remaining in place, 2 were pregnant, 2 were unable to be reached. (66% v 0%)) 80% of PPIUD preferred this placement time **Conclusion:** Postplacental IUD placement may be a superior way to capture women for desired contraception than traditional postpartum timing	**Strengths:** **-**Randomization -No infrastructure concerns **Limitations:** -Pilot study with a small sample size and the population was limited to adolescents. -Poor recruitment and retention

Author Recommendations: A larger scale study should be performed in a facility that can capture an adequate population size.

Implications: Postplacental IUD placement may be a more effective way to capture women for placement of LARC and shorten IPI compared to traditional postpartum placement timelines. Women are more likely to participate in postpartum follow-up with a device in place at the time of birth and are less likely to be pregnant or without contraception at six months postpartum than those that receive IUD at the time of the traditional postpartum visit.

<table>
<tr><td colspan="4">Source: Sucak, A., Ozcan, S., Çelen, Ş., Çağlar, T., Göksu, G., & Danışman, N. (2015). Immediate postplacental insertion of a copper intrauterine device: A pilot study to evaluate expulsion rate by mode of delivery. BMC Pregnancy and Childbirth, 15(1). https://doi.org/10.1186/s12884-015-0637-6</td></tr>
<tr><td>Purpose/Sample</td><td>Design (Method/Instruments)</td><td>Results</td><td>Strengths/Limitations</td></tr>
<tr><td>Purpose:
To look at expulsion risk with PPIUD insertion

Sample/Setting:
160 pregnant women in Ankara, Turkey.

Level of evidence:
I

Quality of evidence:
High</td><td>Prospective Cohort Study

160 total women had CuPPIUD placed. within 10 minutes postpartum. Follow up was performed at 6 weeks, 6 months, and 12 months to determine continued use and satisfaction of use.</td><td>At 6 and 12 months, vaginal delivery experienced an 11.3% expulsion rate (no expulsion after 6 months), unlaboring cesarean 6.5% at six months and 8.7% at 12 months. Laboring cesarean 8.9% at 6 and 12 months (p => 0.05 in all comparisons). Multiparity had a twofold increase in expulsion.

Conclusion:
Rates of expulsion were similar and the only independent factor in expulsion was parity.</td><td>Strengths: This is the first time controlled trial has exhibited labor not having a negative correlation with expulsion.

Limitations:
-Smaller sample size</td></tr>
<tr><td colspan="4">Author Recommendations: Larger studies needed to determine the effect of parity and labor on expulsion with PPIUD.</td></tr>
<tr><td colspan="4">Implications: Parity and provider technique may have less to do with expulsion than laboring PPIUD placement.</td></tr>
</table>

Source: Whitaker, A. K., Endres, L. K., Mistretta, S. Q., & Gilliam, M. L. (2014). Postplacental insertion of the levonorgestrel intrauterine device after cesarean delivery vs. delayed insertion: A randomized controlled trial. *Contraception*, *89*(6), 534–539. https://doi.org/10.1016/j.contraception.2013.12.007

Purpose/Sample	**Design (Method/Instruments)**	**Results**	**Strengths/Limitations**
Purpose: To compare rate of use of LNG-IUS when placed postplacentally compared to the traditional interval placement of 4-8 weeks post birth **Sample/Setting:** 42 women. Two urban medical centers in Chicago. **Level of evidence:** I **Quality of evidence:** Low	Randomized controlled trial The two randomized arms were immediate (n = 20) vs. delayed (n = 22) postpartum IUD insertion. Follow-up assessments with telephone surveys performed at 3, 6, and 12 months including satisfaction and rate of expulsion and continued use.	Rate of use was 60% at twelve months in the postplacental group and 40% in the interval placement group. Rate of expulsion was 20% in the PPIUD group vs 0% in the interval group (p = .01) **Conclusion:** Higher expulsion postplacentally but similar use at 12 months, Insufficient sample size to power for statistical difference	**Strengths:** Underestimation of return to care at 6 weeks may have much to do with the population being one that would most benefit from placement **Limitations:** -Poor sample retention rate at 33.3% in both groups. -Study was halted early due to slow enrollment.

Author Recommendations: Future studies needed with better ability to reach a definitive conclusion through enhanced retention.

Implications: While this study was unable to power for statistical differences, the higher than expected return for care for IUD placement may suggest the desire of these at-risk populations to have access to contraception with the two visit IUD practice limiting access to obtaining family planning.