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Increasing intrauterine contraception use by reducing barriers to post-abortal and interval insertion☆

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Abstract

Background: We hypothesize that barriers to IUD insertion are central to low utilization in the USA. This study evaluates methods to minimize barriers, including post-abortal insertion, staff training and simplified screening.
Study Design: We obtained data on IUD utilization during three study periods: a control period (Period 1), a period after initiating post-abortal insertion and staff training (Period 2), and a period with these interventions plus simplified screening for interval insertions (Period 3). We evaluated IUD utilization, associated complications and utilization at a similar local agency in which the interventions were not implemented.
Results: We inserted 2172 IUDs during the study, including 1493 interval and 679 post-abortal insertions. In the control period, there were 28 monthly IUD insertions on average, compared to 71 (a 151% increase) and 122 (a 334% increase) in Periods 2 and 3, respectively. IUD utilization at the nearby agency remained relatively constant. Complications remained low.
Conclusions: IUD utilization can be substantially increased through relatively simple, low-cost interventions, with significant potential to reduce unintended pregnancy.

Keywords: Intrauterine device; IUD; Intrauterine contraception; Post-abortal insertion; Barriers

1. Introduction

The intrauterine device (IUD) provides a safe, long-acting form of reversible contraception that continues to be under-utilized in the USA. Both the copper-T380a (Cu-T380a) and the levonorgestrel-releasing intrauterine device (LNG-IUD) are equally or more effective at preventing pregnancy than tubal sterilization [1]. Additionally, IUDs have proven to be one of the most cost-effective forms of reversible long-acting contraception [2]. Despite these advantages, the 2002 National Survey of Family Growth found that only 1.3% of US women of reproductive age use the IUD [3], in contrast to some parts of the world, where IUD is among the most widely used method of reversible contraception [4]. We hypothesize that barriers to insertion of IUDs are central to low utilization in the USA.

Recent evidence-based labeling changes for the Cu-T380a allow for insertion of the device in women who are nulliparous, have a history of pelvic inflammatory disease (PID) or sexually transmitted infection (STI) without current high risk, or are not in a mutually monogamous relationship [5]. Updated WHO medical eligibility criteria have also expanded eligibility to women in whom IUD was previously

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Table 1
IUD Contraindications and special conditions

Contraindications
Current known or suspected untreated endocervical gonorrhea, chlamydia, mucopurulent cervicitis or pelvic inflammatory disease (WHO, 4)
Post-abortal or postpartum endometritis in past 3 months (WHO, 4)
Undiagnosed abnormal vaginal bleeding (WHO, 4)
Pregnancy or suspicion of pregnancy (WHO, 4)
Known cervical cancer that has yet to be treated (WHO, 4)
Known endometrial cancer (WHO, 4)
Known or suspected breast cancer (LNG-IUD only) (WHO, 4)
Known pelvic tuberculosis (WHO, 3/4)
Acute liver disease or liver tumor — benign or malignant (LNG-IUD only) (WHO, 3)
Known or suspected allergy to copper or history of Wilson's disease (CuT380a only)*
Small uterine cavity with sounding less than 6.0 cm*
Suspected or known uterine perforation occurring with placement of a uterine sound during the current insertion procedure*
History of symptomatic pelvic actinomycosis confirmed by a culture*
Special conditions
Abnormalities of the uterus resulting in distortion of the uterine cavity (WHO, 4)
Known or suspected ovarian cancer (WHO, 3)
Current deep vein thrombosis/pulmonary embolism (LNG-IUD only) (WHO, 3)
Presence of risk factors for PID or STIs (WHO 2/3)
Client or her partner has other sexual partners*
Past gonorrhea, chlamydia, mucopurulent cervicitis or PID
Impaired immunologic response to infections
Unresolved or untreated acute cervicitis or vaginitis (WHO, 2)
PID within past 12 months or recurrent PID (>1 episode in past 2 years) (WHO, 2)
Hematocrit <30% (an issue for CuT380a only) (WHO, 2)
History of impaired fertility in a woman who desires future pregnancy*
Impaired blood coagulation response, including use of anticoagulant medications*

WHO class refers to WHO Medical Eligibility Criteria, 2004 [6]: 1=A condition for which there is no restriction for the use of the contraceptive method. 2=A condition where the advantages of using the method generally outweigh the theoretical or proven risks. 3=A condition where the theoretical or proven risks usually outweigh the advantages of using the method. 4=A condition which represents an unacceptable health risk if the contraceptive method is used.

* Shea, K. 2005. Personal Communication regarding PPFA Manual of Medical Standards and Guidelines. 15 May, New York [20].

contraindicated [6]. Office practice, however, has not yet caught up to new evidence. Lingering misperceptions exist among both healthcare providers and the public regarding IUD safety [4,7–9] and contribute to its underutilization.

Screening and office protocols also present barriers to IUD access. Prevailing practice has dictated that STI screening must be completed and negative laboratory results confirmed prior to insertion of an IUD. Such screening requirements necessitate multiple office visits and a waiting period, during which potential IUD users may become pregnant or fail to return for insertion. In light of new evidence-based labeling and updated WHO medical eligibility criteria, it is becoming more acceptable to allow IUD insertion on the same day as STI screening among low-risk women with no clinical evidence of infection [5,6,10,11].

Immediate post-abortal insertion of an IUD has been shown to be acceptable, safe and effective [12–15], and has several advantages to delayed insertion including high motivation, less discomfort, assurance the woman is not pregnant and reduced burden on both patient and healthcare system. Patient labeling for the Cu-T380a and the LNG-IUD, as well as WHO criteria, allows for insertion of an IUD immediately after early abortion [5,6,16]. Nevertheless, day-of-abortion insertions have not become widespread in the USA perhaps due to lingering provider concerns regarding IUD-associated risk of infection and litigation [9]. Recent studies, however, have established that IUD insertion right after a first trimester abortion carries no increased risk of perforation, infection or discontinuation, and only a minimal increase in the risk of expulsion over delayed insertion [17–19].

We hypothesize that a comprehensive effort to minimize barriers to IUD insertion, including immediate post-abortal insertion, staff training and introduction of simplified screening criteria, will result in a significant increase in IUD utilization.

2. Materials and methods

The objective of this study was to evaluate the cumulative impact of three different interventions on IUD utilization in a Northern California Planned Parenthood agency. Interventions included (1) immediate post-abortal IUD insertion, (2) staff and clinician IUD training, and (3) simplified screening criteria for low-risk candidates, allowing for interval IUD insertion on the same day as client screening. A secondary objective was to evaluate IUD-associated complications during these interventions.

We evaluated changes in IUD utilization across three distinct study periods. The first 16 months of the study (November 2002 to February 2004) was a control period prior to any study intervention. Period 2 covered the second 14 months of the study (March 2004 to April 2005), during which we introduced two interventions: immediate post-abortal IUD insertions and staff IUD training. The final 6 months of the study, Period 3 (May to October 2005), included these two interventions with the addition of simplified patient screening criteria.

Following the control period, the first intervention introduced (March 2004) was immediate post-abortal IUD insertion. National protocols incorporating the WHO Medical Eligibility Criteria [6] were individualized for our agency to allow these IUD insertions in the absence of known or suspected infection, contraindications or special conditions (see Table 1) [20]. After receiving standard contraceptive counseling, women desiring intrauterine contraception received IUD client information, were evaluated for eligibility using a company IUD risk factor assessment and provided their informed consent. We gave either prophylactic or treatment dose antibiotics to each

Table 2
IUD Training pilot project: May–October 2004 (sponsored by FEI Women's Health)

IUD Training project launch
• Held initial meeting to brainstorm and identify key issues in agency
• Administered clinician and staff surveys for setting priorities
• Received and summarized survey responses
• Established objectives and timelines
Staff education
• Held education sessions for all staff on IUD indications, myths, and counseling
Clinician education
• Facilitated clinician training sessions
• Reviewed new indications and evidence
• Undertook insertion instruction and individual preceptorship
Patient education
• Developed patient education materials i.e., postcard teaser
• Developed public relations and education plan
Review of training outcomes
• Review of pilot program key findings
• Audio-conference with Planned Parenthood affiliates to disseminate learning
• Tools and documents posted on PPFA Extranet

post-abortal IUD patient, depending on whether the patient's gonorrhea and chlamydia test results were known. Within our agency, prophylactic antibiotics for abortion clients consisted of two 100-mg capsules of doxycycline taken 12 h apart, while treatment consisted of either 7 days of doxycycline (100 mg twice daily) or a single 1-g dose of azithromycin.

In the second intervention of Period 2, agency clinicians and staff underwent a focused IUD training program to reintroduce the Cu-T380a. The training occurred over a 6-month period (May–October 2004) and included familiarizing clinicians with new indications and evidence, clinician instruction in insertion, staff training in IUD counseling and improvements in patient education materials on the Cu-T380a IUD. This program was sponsored by FEI Women's Health and is detailed in Table 2.

At the beginning of Period 3 (April 2005), national protocols were again individualized for our agency to allow simplified screening guidelines for interval insertions. Interval insertions were defined as those not occurring on the day of abortion, including both delayed post-abortal insertions and all other IUD insertions. No distinction was made between types of interval insertion. We revised the screening criteria for IUD candidates to allow IUD insertion on the same day as screening tests among low-risk women. This practice only applied to women without contraindications or special considerations, as outlined in Table 1, effectively eliminating the need for the traditional "pre-IUD" work-up visit for low-risk women. Candidates included patients presenting for periodic well-woman exams or family planning counseling. Only after a woman received standard contraceptive counseling, reviewed IUD client information, and provided informed consent was an IUD inserted. Based on existing recommendations from the literature for interval IUD insertions, no prophylactic antibiotics were given for these insertions [21]. STI testing was accomplished using nucleic acid amplification tests. If results came back positive after an IUD was placed, the patient was brought back for evaluation and treatment according to the current CDC Treatment Guidelines [22].

We obtained statistics on IUD utilization within all eight clinics in the agency over the 3-year study period. To obtain IUD utilization rates within each study period, we extracted

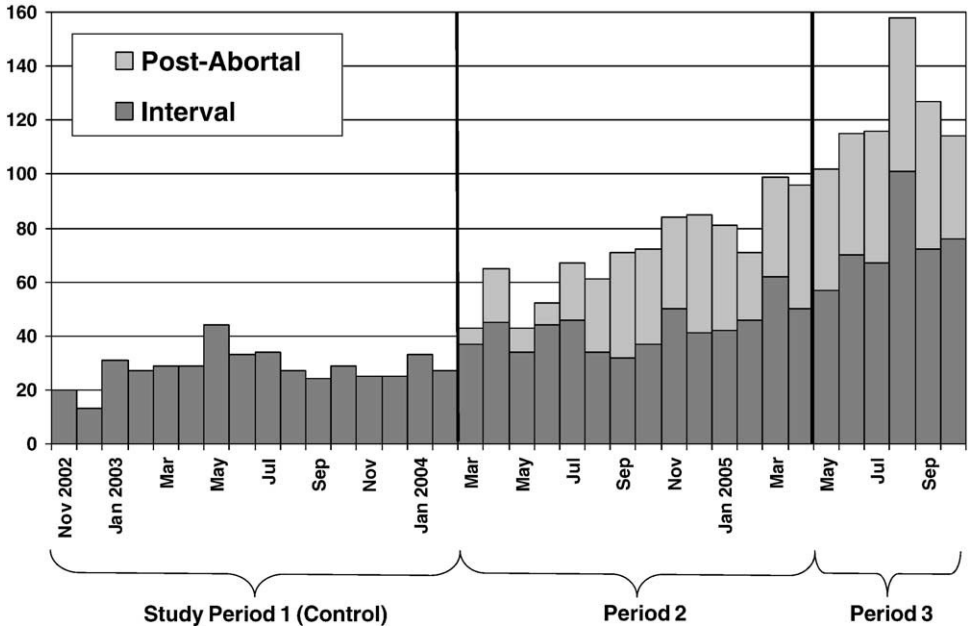

Fig. 1. Monthly IUD insertions, by insertion type (post-abortal and interval).

Table 3
Demographic characteristics of study population

Study period	Control period (prior to inventions)	Study Period 2: post-abortal insertion+staff retraining	Study Period 3: all interventions	*P* value
Total IUD insertions	450	990	732	–
Age (years) [a]	29.0 (6.4)	28.3 (6.5)	27.7 (6.5)	<.001
Family size [b, c]				<.001
1–2	208 (46.3)	595 (60.2)	464 (63.5)	
3–4	191 (42.5)	319 (32.3)	230 (31.5)	
5 or more	50 (11.1)	74 (7.5)	37 (5.1)	
Marital status [c]				<.001
Single	219 (48.7)	606 (61.2)	423 (57.8)	
Married	155 (34.4)	177 (17.9)	138 (18.9)	
Other	76 (16.9)	207 (20.9)	171 (23.4)	
Race/ethnicity [c]				<.001
Hispanic	245 (54.4)	380 (38.4)	286 (39.1)	
White	112 (24.9)	327 (33.0)	247 (33.7)	
African-American	25 (5.6)	111 (11.2)	79 (10.8)	
Asian/Pacific	25 (5.6)	65 (6.6)	43 (5.9)	
Other	43 (9.6)	107 (10.8)	77 (10.5)	
Payment source [c]				.001
Medicaid	431 (95.8)	909 (91.8)	658 (89.9)	
Other insurance	13 (2.9)	28 (2.8)	27 (3.7)	
Self-pay	6 (1.3)	53 (5.4)	47 (6.4)	

[a] Mean (SD).
[b] *n*=4 missing observations.
[c] *n* (percentage).

billing information from the "InfoPoint" Practice Management System. Other data collected from this system included patient demographic characteristics, immediate post-abortal vs. interval IUD insertion, and type of IUD utilized (Cu-T380a vs. LNG-IUD). We also tracked complications associated with IUD use and abortions during the study from a computerized adverse event collection and reporting system (Quantros DoctorQuality Risk Prevention and Management System). As complications were a secondary outcome of our study, we did not routinely seek outside follow-up and complication data, and thus, data presented here may be an underrepresentation of the number of complications.

To ensure that an observed increase in IUD utilization was due to the study interventions and not historical trends, we collected additional data to determine rates of abortions within our agency and rates of IUD insertion in a similar nearby Planned Parenthood agency that did not undertake the focused study interventions. Although the agencies shared a small number of physicians as well as widely available new information on IUD evidence and trends, the nearby agency did not allow day-of-abortion insertions or same-day screening for interval insertions during this period, nor did they undergo concerted training interventions during the study period. We collected data across all three study periods from both agencies for historical comparison.

The unit of analysis in this study was IUD insertions. We compared demographic characteristics, rates of IUD insertion across study periods, and IUD types using χ^2 and *t*-tests for categorical and continuous variables, respectively. We examined rates of removals and compared them between IUD and insertion types, directly adjusting for month of insertion to avoid bias due to unequal follow-up time between insertion types. All statistical analyses were conducted using SAS version 9.1.3.

Table 4
Intrauterine device insertion rates by study period

Study period	Control period (prior to inventions)		Study Period 2: post-abortal insertion + staff retraining			Study Period 3: all interventions		
	n	Rate [a]	*n*	Rate [a]	Rate ratio (95% CI) [b]	*n*	Rate [a]	Rate ratio (95% CI) [b]
Total IUD insertions	450	28.1	990	70.7	2.51 (2.25–2.82)	732	122.0	4.34 (3.85–4.89)
Interval	450	28.1	600	50.0	1.52 (1.35–1.72)	443	73.8	2.63 (2.30–2.99)
Post-abortal	0	N/A	390	32.5	N/A	289	48.2	N/A
Cu-T380a	314	19.6	558	39.9	2.03 (1.77–2.33)	376	62.7	3.19 (2.75–3.71)
LNG-IUD	136	8.5	432	30.9	3.63 (2.99–4.40)	356	59.3	6.98 (5.73–8.51)
Ratio Cu-T380a: LNG-IUD	2.31	–	1.29	–		1.06	–	

[a] Average insertions per month.
[b] Relative to control period. The percent increase in IUD use equals [(rate ratio −1)∗100].

Table 5
Gestational age of women receiving post-abortal IUDs

Gestational age (weeks)	LNG-IUD	Cu-T380a	All post-abortal
4–6	135 (34.4%)	124 (43.4%)	259 (38.1%)
7–11	223 (56.7%)	140 (49.0%)	363 (53.5%)
12–13	31 (7.9%)	15 (5.2%)	46 (6.8%)
14–15	1 (0.3%)	5 (1.8%)	6 (0.9%)
16–18	3 (0.8%)	2 (0.7%)	5 (0.8%)

Institutional Review Boards at the University of California at San Francisco and University of Pittsburgh approved the study.

3. Results

During the 3-year study, we inserted 2172 IUDs (including 1248 Cu-T380a and 924 LNG-IUDs) in women receiving care in our agency. Of these, 1493 were interval and 679 were post-abortal insertions. Fig. 1 shows the continued increase in the number of IUDs inserted monthly over the duration of the study, broken down by post-abortal and interval insertions.

Demographic characteristics of the patients receiving an IUD during each study period are described in Table 3. Each study period had progressively more women using the IUD who were young, of smaller family size, single, non-Hispanic and self-paying. In our study, over 90% of IUD users were on Medicaid-equivalent coverage (i.e., <200% of the federal poverty level). The percentage of private pay clients accepting IUDs increased over the duration of the study (p=.001).

Average monthly IUD insertions increased progressively over the three study periods (Table 4). There was a mean of 28 insertions per month during the control period, compared to 71 per month during the second study period (a 151% increase, 95% CI 125–182, p<.001) and 122 per month in the period with all interventions (a 334% increase, 95% CI 285–389; p<.001). The monthly rate of abortions remained relatively constant from study Period 1 to study Period 3 (a 11% increase, 95% CI 6–15). The ratio of LNG-IUD to Cu-T380a insertions increased over the duration of the study so that approximately equal numbers of each were inserted in the final study period. IUD utilization rates at a nearby Planned Parenthood agency that did not undertake any of the tested interventions increased only modestly from the control period to the final study period (a 20% increase, 95% CI 11–29) during which time the nearby agency experienced a 3% increase in the number of abortions. The other agency's increase in IUD utilization was over 15 times less without the focused interventions.

Following the initiation of post-abortal IUD insertions, 5.7% of women receiving aspiration abortions at our agency opted for immediate post-abortal IUD insertion in study Period 2, while 9.1% had an IUD inserted immediately post-procedure in study Period 3. Of the 679 post-abortal IUD insertions, fewer than 2% occurred in the second trimester (Table 5).

Complications were rare overall, reported among less than 2% of the study population over the course of follow-up (Table 6). Among those with insertions in study Period 2, complications were reported for 5.4% of post-abortal insertions compared to 1.8% of interval insertions (p=.002). In study Period 3, complication rates were similar between

Table 6
Complications experienced during study follow-up

Study period	Control period (prior to inventions)		Study Period 2: post-abortal insertion+staff retraining				Study Period 3: all interventions			
Insertion types	Interval		Interval		Post-abortal		Interval		Post-abortal	
	n	%	*n*	%	*n*	%	*n*	%	*n*	%
Total insertions	450	–	600	–	390	–	443	–	289	–
Complications associated with IUD										
Expulsion	1	0.2	5	0.8	12	3.1	4	0.9	2	0.7
Infection	0	0.0	2	0.3	4	1.0	0	0.0	1	0.3
Failure (pregnancy)	0	0.0	2	0.3	0	0.0	0	0.0	0	0.0
Displaced strings	0	0.0	1	0.2	1	0.3	0	0.0	0	0.0
Syncope	0	0.0	0	0.0	0	0.0	1	0.2	0	0.0
Pain[a]	0	0.0	1	0.2	0	0.0	0	0.0	1	0.3
Complications associated with abortion										
Continuing pregnancy	N/A	–	N/A	–	0	0.0	N/A	–	1	0.3
Incomplete abortion	N/A	–	N/A	–	3	0.8	N/A	–	0	0.0
Hematometra	N/A	–	N/A	–	1	0.3	N/A	–	0	0.0
Total Complications	1	0.2	11	1.8	21	5.4	5	1.1	5	1.7

[a] Requiring management.

post-abortal and interval insertions (1.7% and 1.1%, respectively, p=.49).

Reported rates of expulsion during the entire study period were 0.7% for women with interval insertions and 2.1% for women receiving post-abortal IUDs. The percent of expulsions reported among women receiving post-abortal IUDs decreased from study Period 2 to Period 3 (p=.03). Expulsions were more frequent among women with pregnancies over 12 weeks' gestation (7.0% vs. 1.6%, p=.02).

There were 264 voluntary IUD removals among those inserted during the study (12.2% of insertions), and no pregnancies with an IUD in place. Of those with a removal date in the database (n=258), mean time to IUD removal was 9.5 months (SD 6.9, median 3.9 and range 0–34.3 months). After adjusting for month of insertion, removal rates were not significantly different between interval and post-abortal IUD insertions (9.9% and 9.7%, respectively). Although the rate of IUD removals did not increase among interval inserters with initiation of simplified screening criteria (study Period 3), different follow-up times do not allow conclusion. There was no statistically significant difference in removals between LNG-IUD (12.8%) and Cu-T380a (11.7%) users. Please see the companion article for further information on post-abortion IUD removals and expulsions in this study population [23].

At the nearby agency not undertaking the study interventions, the rate of IUD removal was 9.1% during the study period. Of those with a documented removal, mean time to IUD removal was 9.1 months (SD 8.0, median 7.0 and range 0–35.2 months).

4. Discussion

This study supports the hypothesis that barriers to IUD insertion are central to low utilization. A multi-fold increase in IUD utilization can be successfully accomplished over a limited time period through staff training and other protocol changes allowing broader indications, simplified screening criteria and immediate post-abortal insertion.

It has been conventional practice to await STI screening results prior to insertion of IUD; however, our results suggest that IUD utilization increases when screening requirements are simplified without a significant decrease in IUD continuation. Even in study settings, approximately 40% of patients scheduled to receive delayed IUD following an abortion did not return for the procedure [18,19]; it is likely that a similar "drop-out" effect occurs in delayed interval insertion as well. Current evidence indicates that a comprehensive risk assessment and clinical exam can identify appropriate low-risk candidates for immediate IUD insertion [10,11]. Simplified screening requirements are appropriate in light of new Cu-T380a indications and new WHO medical eligibility criteria, and can reduce the burden on the majority of women desiring an IUD who do not have active endocervical infection.

Prophylactic and treatment doses described in Materials and Methods were within the range of standard antibiotic prophylaxis used for abortion [24,25], while further studies are pending regarding recommended antibiotic prophylaxis for sequential abortion and IUD insertion. If STI screening tests came back positive after an IUD was placed, antibiotics were either given (for interval insertions) or extended (for day-of-abortion insertions).

The demographic characteristics of our study population changed as the IUD became more available through updated protocols and implementation of interventions. From the control period to the final study period, IUD users became significantly younger, less parous, more likely to be single and less likely to be Hispanic (Table 1). Self-payment was not a barrier to IUD use in this population, as witnessed by an increasing percentage of self-paying IUD users from the control to final study period. During the same period, all self-paying family planning clients decreased in our agency (~8% to 5% from 2003 to 2005).

Overall, results of our analysis of women who received immediate post-abortal IUD are consistent with current evidence that post-abortal insertion does not carry an increased risk of complications [12,17–19]. The expulsion risk among women with immediate post-abortal insertions (2.1%) remained at or below rates reported in the literature (2–10%) [1]. Risk of expulsion with post-abortal IUD insertion decreased from study Period 2 to 3, suggesting a learning curve as clinicians became more skilled at post-abortal placement and follow-up.

Our study has various limitations. We obtained study data from a billing and tracking database. Demographic information was therefore limited with no available information on women's gravidity and parity (family size was used as a proxy and referred to the number of people supported by household income, which has the limitation that it may vary somewhat by household structure and socioeconomic status). Because we evaluated the impact of three interventions, it is not possible to differentiate the effects of each on IUD utilization. IUD-related complications were a secondary outcome and our study was not powered to detect significant differences in complications between groups. Complication tracking required clinician data entry and may have under-reported actual complications. Women may have had complications that were managed outside our clinic system although this should be equal between groups. Because our study had a short duration of follow-up which decreased with insertion later in the study period, and because post-abortal insertions occurred only after the control period, their long-term complications may be underestimated. However, it is reassuring that our results of post-abortal expulsions were consistent with prior published reports, including the pattern of slightly increased expulsions with progressive gestational age at time of insertion [12,13]. IUD complication data were not available to us from the nearby Planned Parenthood agency. In addition, there may have been some shared exposure between agencies to new IUD information,

practices and trends in utilization, even though the other agency did not undertake the specific interventions tested.

Among women in our study who received an IUD under simplified screening criteria (Period 3), complications were minimal and there were no reported infections for the duration of study follow-up. Existing evidence demonstrates that increased PID primarily occurs within the first 3 weeks post-insertion [1,21]; therefore, it is unlikely that higher rates of IUD-related infection would have been observed even with longer follow-up. Further research is needed on complications and satisfaction among women who receive an IUD under simplified screening criteria.

Our research suggests that three simple interventions can dramatically increase IUD utilization, without compromising patient safety. The interventions had a cumulative increase of greater than fourfold use during the study. Immediate post-abortal placement of an IUD is expected to significantly decrease unintended pregnancy in the year following abortion compared to delayed insertion [15]. Further research should confirm the impact of both simplified IUD screening criteria and immediate post-abortal insertion on future rates of abortion. Because the IUD is among the most effective forms of contraception, increased utilization has broad potential implications for unintended pregnancy and abortion.

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