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Use of an Evidence-Based Guideline for Management of Side Effects from Long-Acting Reversible Contraceptives: A Quality Improvement Report

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Abstract

Introduction

Many health care providers believe that women who initiate long-acting reversible contraceptives (LARC) discontinue the method because of side effects too soon for the method to be economical. The purpose of this quality improvement project was to implement and evaluate an evidence-based telephone triage nursing guideline for management of side effects of LARC with an ultimate goal of reducing the number of early discontinuations.

Process

A telephone triage guideline was adapted from the Contraceptive Choice Project's Clinician Call Back System, supplemented with evidence-based resources, and approved by clinicians at 2 community women's health and midwifery offices. Baseline retrospective data were collected on all women over the age of 18 who had LARC inserted at the 2 sites in the year prior to guideline implementation and in the 3 months after implementation. Rates of LARC removal at or before 3 months postinsertion, before and after guideline implementation, were evaluated.

Outcomes

Approximately 1 in 5 women called for help managing LARC side effects. Of the callers, 3 of 32 (9.4%) women receiving standard care discontinued their LARC prior to 3 months, whereas 0 of 24 women who were triaged using the guideline discontinued their LARC prior to 3 months ($P = .12$). Cramping, bleeding, and malposition or expulsion were the most common concerns and reasons for discontinuation.

Discussion

Fewer women than anticipated called to report side effects, and even fewer chose to discontinue their LARC early. There were fewer discontinuations with guideline use, but this was not a statistically significant difference. Most women did not discontinue their LARC early for any reason, including side effects.

Disciplines

Nursing

Comments

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Use of an Evidence-Based Guideline for Management of Side Effects from Long-Acting Reversible Contraceptives: Manuscript Draft

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Conflict of interest:

The authors have no conflicts of interest to disclose.

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Précis: Few women experience LARC adverse effects; very few discontinue early. Use of the guideline is associated with a trend in decreased early discontinuation.

Structured Abstract

Introduction

Long-acting reversible contraceptives (LARC) are safe, highly effective methods for pregnancy prevention that are cost effective if used for an extended duration. Many healthcare providers believe that women who initiate LARC do not tolerate the common side effects and choose to remove them too soon for them to be economical. The purpose of this pilot study was to develop, implement, and evaluate an evidence-based telephone triage nursing guideline to manage side effects of LARC to reduce the number of LARC users who discontinue their method early.

Methods

Baseline retrospective data was collected on a convenience sample of all women over age 18 who had LARC inserted in the prior year at two community women's health and midwifery offices. The guideline was then implemented and data collected for three months post-insertion on a convenience sample of all women over 18 who had LARC inserted after guideline implementation. Chi-square testing and Kaplan-Meier survival analysis were used to evaluate the efficacy of the guideline on rates of LARC removal at or before 3 months post-insertion.

Results

In both cohorts, approximately 1 in 5 women called for help managing side effects. Of the women who called, 9.4% of women receiving standard care discontinued their LARC prior to 3 months, while zero women who were triaged using the guideline discontinued their LARC prior to 3 months ($p = 0.12$).

Discussion

Fewer women called to report side effects than anticipated, and even fewer chose to discontinue their LARC early. The small numbers of women calling and discontinuing lowered statistical power, but there was a trend toward fewer early discontinuations with use of the telephone triage guideline compared to use of non-standardized management strategies.

Keywords: Contraception/Family Planning, Gynecology, Pain Management, Preventative Health Care, Sexual Health, Long-Acting Reversible Contraception, Intrauterine Devices, Adverse Effects

Quick Points:

- LARC are an efficacious and cost-effective option for women wishing to avoid pregnancy for an extended duration.
- Very few women discontinue their LARC methods early for any reason.
- Contrary to popular provider perception, most women continue their LARC beyond 3 months, when side effects are most troublesome.
- Use of a guideline for managing the adverse effects of LARC may decrease the rate of early discontinuation of the devices.

Introduction & Background

Long-acting, reversible contraceptives (LARC) are a popular topic due to their proven efficacy at preventing unplanned pregnancy. LARC include both levonorgestrel intrauterine devices (IUDs) and copper IUDs as well as etonorgestrel subdermal implants (SDIs). A single LARC can be used continuously for up to 3-12 years and are more than 99% effective with both perfect and typical use. Once inserted, they are effective almost immediately and continue to work until expiration without any further effort by the user.[1] At the time of insertion, LARC methods are more expensive than other contraceptives, but if used for an extended duration, their average cost is comparable to or less than the other methods.[2]

Although LARC are recommended by several major medical organizations as first-line contraceptives for all women wishing to avoid pregnancy,[3,4,5] LARC remain underutilized in the United States. While low LARC usage is multifactorial, part of the problem is provider ambivalence toward LARC. This is due to the perception that many women discontinue their LARC due to side effects too early for the method to be a cost-effective choice.[6] Early removal due to side effects, especially cramping and bleeding, is documented in the literature,[7,8,9,10,11] although the definition of "early removal" is not standardized. However, no study has evaluated the methods for managing LARC side effects with the goal of minimizing discontinuation due to LARC side effects. The purposes of this study included evaluation of the characteristics of women utilizing LARC methods, their complaints and reasons for early discontinuation, and whether rates of early discontinuation improved after implementation of a standardized, evidence-based telephone triage guideline for management of LARC side effects.

The Interaction Model of Client-Health Behavior was used to design this study. Central concepts of the model include client singularity, client-professional interaction, and health outcomes.[12] Client singularity was utilized to identify the pertinent demographics and individual variables that might impact the outcomes of interest, as well as factor in the individual variables outside of provider control that must be considered when applying conclusions. Client-professional interaction served as the basis for using a guideline to assist nurses in managing the side effects experienced by the LARC user. Health outcomes were the measurable results of the client health behavior; in this study,

the primary outcome was whether the women removed their LARC prior to 3 months' use.

Methods

This pilot study utilized a two cohort, time-series design with analysis of retrospective electronic medical record data from LARC users before and after guideline implementation. The study was conducted at two institutionally-affiliated women's health and midwifery clinics in an urban setting. This study received exempt status from the St John Fisher College IRB prior to initiation of the study procedures.

A convenience sample of LARC users was identified from an insertion log kept in the regular course of practice at the two clinics. Because data was collected retrospectively and de-identified prior to analysis, consent was not required, and so data was collected from all adult women (age ≥18 years) who had LARC inserted at the clinic during the dates specified by the cohort. The first cohort included women who had any type of LARC (hormonal IUD, copper IUD, or SDI) placed between March 1, 2016 - February 28, 2017. A computer algorithm was used to pull insertion, post-insertion visit, phone call, or procedure notes for each woman. Notes were de-identified and then the following data was manually abstracted: age, gravidity & parity, postpartum status (having given birth within 3 months prior to insertion date), LARC type, number of phone calls, and complaint reported in the phone call. The primary outcome, whether each woman discontinued her LARC prior to 3 months' use and if so, for what reason, was also abstracted from these notes. A separate algorithm was used to identify race and insurance type for each woman. Data were organized by a randomly assigned subject ID and compiled into an Excel spreadsheet.

An evidence-based guideline for managing LARC side effects using telephone triage was developed by the researcher (JJ). The guideline includes a flowchart for triaging patient calls related to LARC issues, a list of signs of clinical urgency requiring immediate care, and specific guidelines with rationale for management of common LARC side effects including dysmenorrhea, menorrhagia & metrorrhagia, increased vaginal discharge, hormonal side effects, dyspareunia, and pain at insertion site. Prior to implementation, the guideline was reviewed by clinical experts and approved by lead providers at the clinical sites. The guideline was reviewed with triage RNs at both clinical

sites over three separate days prior to implementation. The guideline was distributed to clinical providers via email prior to implementation. All providers and RNs were encouraged to contact the researcher with questions or concerns about the guideline at any time. The guideline was implemented on June 1, 2017.

The second cohort included women who had any type of LARC placed between June 1 and September 1, during guideline implementation. A computer algorithm was used to pull insertion, post-insertion visit, phone call, or procedure notes for each woman and then the same variables were abstracted and recorded as was done in Cohort 1. Data was aggregated and reviewed in Excel, and statistical analyses were completed using SPSS. Chi-square, t-testing, and Kaplan-Meier life table analysis were used for comparisons.

Results

A total of 293 LARC users were included in the study. One subject had been excluded due to missing data. Due to the shorter available data collection period, there were more women in Cohort 1 (n=183) than Cohort 2 (n=110). Comparative data for all LARC users is displayed in Table 1. Chi square tests showed significant differences between cohorts, including race, use of public insurance, postpartum status, and type of LARC ($p<0.001$). The percent of women who called to report LARC side effects was not significantly different between Cohort 1 and Cohort 2 ($p=0.36$).

Approximately 1 in 5 women called with a complaint of LARC side effects. Descriptive statistics for callers can be seen in Table 2. Of these women, there were no statistically significant demographic or descriptive differences between Cohort 1 and Cohort 2, although power was limited due to small sample size. As shown in Table 3, the most common complaints of callers were bleeding (55.6%) and cramping (32.1%). Only 23 women (7.8%) had their LARC removed during follow-up, and only 11 (3.9%) discontinued their LARC within 3 months of insertion. The reasons for early discontinuation are listed in Table 4. Of note, 5 of the 23 women discontinued their LARC due to expulsion or malposition (included in the “other” category) and zero discontinued due to cramping.

Two-tailed Chi-square (with T-tests for the continuous variable, age) was used to determine whether variables were associated with the primary outcome (whether LARC

users in each cohort had discontinued their LARC prior to 3 months post-insertion). Results of these tests for all LARC users and for the Callers subset can be viewed on Table 5. No statistically significant association was found between any variables and discontinuation except for cohort designation (p=0.047) among all LARC users. Among the callers subset, no statistically significant association was found between any variables and discontinuation. Kaplan-Meier survival analysis was used to analyze the pattern of discontinuation between cohorts among the caller subset, as seen in Figure 1. A trend toward less discontinuation in Cohort 2 was noted, although it did not reach statistically significance (Log Rank p= 0.13). Multivariable Cox regressions in the Caller subgroup, intended to adjust for differences between the two cohorts (i.e., assess for possible confounding), could not be performed due to insufficient sample size.

Discussion

Although the study was limited by sample size and duration of follow-up, the results provide additional information on the relationships between side effects, duration of LARC use, and removal. These conclusions largely support the existing evidence but also provide additional insight into the LARC user and provider experience.

A common belief is that most women experience LARC side effects after insertion. While this study could not determine how many women experienced side effects, it did show that approximately 1 in 5 women called for assistance in managing their side effects. If any of the other 80% who did not call had adverse effects, it is assumed that they were tolerable without medical management or could wait until a scheduled follow-up appointment at 6-8 weeks post-insertion.

Providers commonly perceive that “many” women get their LARC out early due to side effects,[6] although this perception has been challenged in the literature.[7,8,9,10,11] In this study, only 8% of women discontinued their LARC early, and even fewer (5.5%) discontinued within three months. This suggests that most women do continue their LARC past the first three months, when side effects are most troublesome, contrary to provider perception. It is likely that provider perception is influenced by availability bias, providing more reason for evaluation of real patient outcomes to counteract this perception.

The rate of calls for LARC complaints was not significantly different between cohorts; however, 3 callers discontinued their LARC in Cohort 1, versus 0 in Cohort 2. While not statistically significant and limited by the number of women who called, there is clinical value in decreasing early LARC removal from 3 to 0. Viewed a different way, 100% of women in Cohort 2 who were counseled using the guideline decided to continue their LARC past 3 months, which provides some evidence to support further evaluation and possible dissemination of the guideline.

Strengths of this study include a diverse sample, complete data, and precise descriptive data due to sampling technique. The conclusions support existing evidence and provide evidence supporting further evaluation of the triage guideline. In addition, the conclusion that only a small proportion of women choose to remove LARC early for any reason, but especially due to side effects, refutes the belief that, for many women, LARC are not a cost-effective option.

This study had limitations. Statistical power was restricted by the small sample size of the subset of callers. As previously discussed, multivariable regression to adjust for between-cohort differences could not be done on the Caller subgroup. Although none of the differences had univariate associations with outcome, the numbers were small. In addition, follow-up data was limited by the short duration of follow-up, dictated by the parameters of the pilot study. Since women often presented for routine follow-up appointments after LARC placement without calling telephone triage, some opportunities for use of the guideline were lost. Revision and evaluation of the guideline for use in pre- & post-insertion and follow-up counseling could provide insight into the efficacy of the guideline in these circumstances. Lastly, political and economic factors may have influenced LARC continuation.

Further research into the efficacy of the guideline is warranted. Future studies can provide larger samples in conjunction with longer follow-up. Qualitative data regarding patient satisfaction and experience with side effect management is important to ensuring that patient autonomy is not lost in the pursuit of high contraceptive efficacy and cost-effectiveness.

Conclusion

The trend toward decreased discontinuation of LARC with use of the guideline (although not statistically significant) and the absence of known risks to utilizing the guideline supports dissemination and use of the guideline, with continued evaluation, in women's health, primary care, and pediatric practices to improve LARC use. Use of the guideline could reduce health care costs by reducing patient visits for management of side effects and more effectively utilizing the nursing scope of practice. LARC have the potential to improve the lives of women if the healthcare system is adequately able to support the LARC users for as long as they wish to continue the method.

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Table 1: Descriptive Statistics for All LARC Users by Cohort (n = 293)

Demographic Characteristics	**Cohort 1**	**Cohort 2**	**p-value**
Total n	183	110	
Mean Age (years)	30.2 (SD 6.2)	29.8 (SD 7.8)	0.78
Race			<0.001
Black	24 (13.1%)	35 (31.8%)	
White	141 (77.0%)	59 (53.6%)	
Other	18 (9.8%)	16 (14.5%)	
Public Insurance[a]	63 (34.0%)	62 (56.4%)	<0.001
Nulliparity	28 (15.3%)	23 (20.9%)	0.22
Postpartum	91 (49.7%)	33 (30.0%)	<0.001
# LARC Users Called	32 (17.5%)	24 (21.8%)	0.36
Type of LARC			<0.001
Nexplanon	27 (14.8%)	44 (40.0%)	
Hormonal IUD	102 (55.7%)	51 (46.4%)	
Copper IUD	51 (27.9%)	13 (11.8%)	

Age evaluated with t-testing, and all others with chi-square

[a]Medicaid

Table 2: Descriptive Statistics for Callers Subset by Cohort (n = 56)

Demographic Variables	Cohort 1	Cohort 2	p-value
Total n	32	24	
Mean Age (years)	28.4 (SD 5.6)	29.8 (SD 7.2)	0.43
Race			0.12
Black	5 (15.6%)	7 (29.2%)	
White	23 (71.9%)	17 (70.8%)	
Other	4 (12.5%)	0 (0%)	
Public Insurance[a]	12 (35.7%)	12 (50.0%)	0.35
Nulliparity	8 (25.0%)	5 (20.8%)	0.72
Postpartum	11 (34.4%)	4 (16.7%)	0.14
Type of LARC			0.22
Nexplanon	4 (40.0%)	6 (25.0%)	
Hormonal IUD	15 (40.6%)	13 (27.8%)	
Copper IUD	13 (46.9%)	5 (54.2%)	

Age evaluated with t-testing, and all others with chi-square
[a]Medicaid

Table 3: Reported LARC Side Effects of Callers (n = 56)

Side Effect Reported	n (%)
Bleeding	31 (55.4%)
Cramping	18 (32.1%)
Other	8 (14.3%)
Vaginitis	7 (12.5%)
Hormonal	6 (10.7%)
Dyspareunia	2 (3.6%)
Pain at Insertion Site	1 (1.8%)

Some callers reported multiple side effects, so total percentage >100

Table 4: Reasons for Early LARC Discontinuation (n = 23)

Complaint	**n (%)**
Other	8 (34.8%)
Bleeding	5 (21.7%)
Hormonal	5 (21.7%)
Desire Conception	4 (17.4%)
Vaginitis	1 (4.3%)

Table 5: Analysis of Associations Between Variables and Early Discontinuation

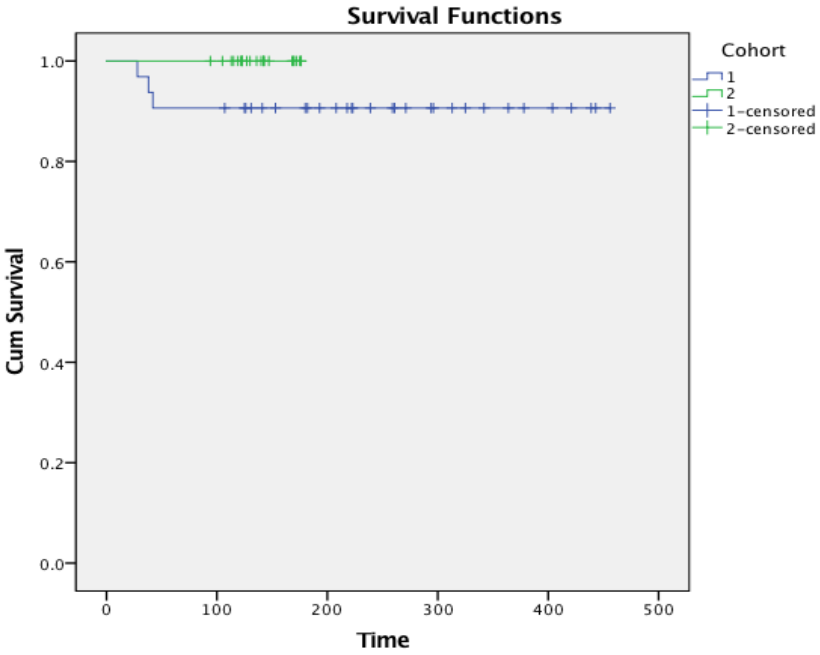
ALL LARC USERS			
Variables	**Discontinued <3mos**	**Continued at 3 mos**	**p-value**
Age	31.3 years (SD 8.3)	29.9 years (SD 6.8)	0.51
Race			0.74
White	7 (3.5%)	193 (96.5%)	
Black/Other	4 (4.3%)	89 (95.7%)	
Insurance			0.67
Public Insurance[a]	4 (3.2%)	121 (96.8%)	
Other Insurance	7 (4.2%)	161 (95.8%)	
Parity			0.38
Nulliparous	3 (5.9%)	48 (94.1%)	
Parous	8 (3.3%)	234 (96.7%)	
Postpartum			0.30
Yes	3 (2.4%)	121 (97.6%)	
No	8 (4.7%)	161 (95.3%)	
LARC Type			0.24
Copper IUD	4 (6.3%)	60 (93.7%)	
Hormonal IUD or SDI	7 (3.1%)	222 (96.9%)	
Cohort			0.05
1	10 (5.5%)	173 (94.5%)	
2	1 (0.9%)	109 (99.1%)	
CALLERS			
Variables	**Discontinued <3mos**	**Continued**	**p-value**
Age	29 years (SD 8.2)	29 years (SD 6.3)	0.99
Race			0.26
White	3 (7.5%)	37 (92.5%)	
Black/Other	0 (0%)	16 (100%)	
Insurance			0.12
Public Insurance[a]	0 (0.0%)	24 (100%)	
Other Insurance	3 (9.4%)	29 (90.6%)	
Nulliparity			0.67
	1 (7.7%)	12 (92.3%)	
	2 (4.7%)	41 (95.3%)	
Postpartum			0.28
	0 (0%)	15 (100%)	
	3 (7.3%)	38 (92.7%)	
LARC Type			0.96
Copper IUD	1 (5.6%)	17 (94.4%)	
Hormonal IUD or SDI	2 (5.3%)	36 (94.7%)	
Cohort			0.12

1	3 (9.4%)	29 (90.6%)	
2	0 (0%)	24 100%)	

[a]Medicaid

Age evaluated with t-testing, and all others with chi-square or Fisher's exact test

Figure 1: Kaplan-Meier Survival Analysis of Discontinuation of Callers Over Time in Days



Log-Rank Test: p = 0.127

Guideline for Managing LARC Side Effects

Adapted with permission from the Contraceptive Choice Project:
Clinician Call-back System[1] and IUD & Implant FAQs[2,3]

Goal: to effectively manage side effects of long-acting reversible contraceptives (LARC) primarily using telephone triage while promoting patient autonomy.

LARC: Long-acting reversible contraceptives, including the copper IUD (Paragard), hormonal IUDs (Mirena, Liletta, Skyla), and hormonal implant (Nexplanon)

This guideline is intended to guide clinical practice in relevant patient care scenarios. It is not a substitute for clinical judgment.

Table of Contents

Patient Call Flowchart

- All patient calls regarding existing LARC to be forwarded to Triage RN
    - Patient is requesting removal of LARC
        - Due to desire for pregnancy?
            - Schedule appointment
        - Due to expiration of device (confirmed)?
            - Determine whether new LARC is desired
            - Schedule appointment
        - Due to complaint of side effects?
            - See below: complaints of side effects
    - Patient has complaint of side effects from LARC
        - Is complaint is a sign of clinical urgency?
            - Consult with on-site provider for next step (ED, stat visit)
        - Is this the first cycle in which patient is reporting side effects of LARC?
            - See guideline for specific side effect management
        - Has the patient tried recommended side effect management strategies?
            - If multiple strategies have been unsuccessful for 1 cycle, assess whether patient is amenable to continuing strategies for longer.
                - If patient insists on removal, schedule removal
                    - Further discussion of management & options to be done at removal appointment by provider
        - Is patient too emotional to be triaged by telephone?
            - Inform patient that she can schedule appointment to further discuss her concerns with provider

Signs of Clinical Urgency

- Currently hospitalized with method-related problem
- Excessive vaginal bleeding (saturating >1 pad per hour)
- Fever within 3 weeks of IUD or implant insertion
- Severe redness, swelling, or drainage at implant insertion site
- Severe pelvic pain (patient cannot get out of bed or move)

Consult with provider to refer to ED or make STAT same-day appointment[4,5,6]

Management of Complaints with IUDs & Contraceptive Implants

Complaint	Management Strategy	Rationale
Cramping after insertion or with menses (dysmenorrhea)	Cramping is usually worst in the first 3 months after IUD insertion and each month will usually subside by day 3 of the menstrual cycle. **1.** Heat and rest, as well as exercise, may help relieve cramping[6,8] **2.** Take low-dose ibuprofen or naproxen sodium to help with the cramping[2,6,8]	Dysmenorrhea is worst for the first few cycles after IUD insertion, especially with the Copper IUD[2,6] Cramping is an uncommon complaint for implant users but may occur as their cycles adapt to the continuous hormone level[4,7]. Mild to moderate dysmenorrhea can be managed with a 3-day course of NSAID therapy[2,6]. Patients with persistent dysmenorrhea or new-onset dysmenorrhea >6 months after insertion should be evaluated for pelvic inflammatory disease, ectopic pregnancy, and IUD malposition[6]
Long, heavy, or irregular menses (menorrhagia or metorrhagia)	**1.** Reassure patient that bleeding is often irregular for first 3-6 months of use but improves/stabilizes over time with IUD and implants. Hormonal IUDS and implants often result in amenorrhea over time [4,6,8]. **2.** Over-the-counter (RN to consult with provider before recommending): • Rule out contraindications to NSAID use • Start regimen at onset of bleeding • Ibuprofen 600mg tab TID x 5-7 days OR • Naproxen sodium 220mg tab 2 tabs BID x 5-7 days[2,3,4,6,7,8] If unsuccessful x1 cycle: **3.** Rx (forward request to provider) one of the following: • Naproxen sodium 500mg tab 1 tab PO BID x 5-7 days	Irregular bleeding with hormonal contraception is considered to be a result of the thick endometrium thinning and developing a dense but fragile capillary network that are prone to incidental bleeding over the first 3-6 months after insertion[2,4,7,8] Reassurance is the primary management strategy as symptoms generally resolve on their own within this time[4,6,7] NSAIDs and doxycycline act as prostaglandin synthetase inhibitor to restrict pain and bleeding. Estrogen in COCs can stabilize the uterine lining to reduce bleeding[2,3,6,7,8] Contraindications to NSAID use include known NSAID allergy, renal disease or impairment, history of gastric ulcers, and concurrent corticosteroid or anticoagulant use. Patient history should be carefully reviewed by provider before high-

	• Estrogen supplementation o Conjugated estrogen 1.25mg 1 tab PO daily x 7-14 days o Micronized estradiol 2mg tab PO daily x 7-14 days o Transdermal estrogen patch 0.1mg for 7-14 days • Mefenamic acid 500mg tab BID x 5-7 days • Transexamic acid 500mg tab BID x 5-7 days • Doxycycline 100mg tab 1 tab PO BID x 7 days[2,3,4,6,7,8]	dose NSAID regiment is recommended[9] If irregular bleeding persists despite management strategies or patient refuses strategies, an appointment for removal should be scheduled to initiate a different contraceptive method[1,4] New or worsening bleeding after the first 6 months of LARC use warrants further evaluation for other causes[4,7,8]
Increased vaginal discharge	Clear or milky vaginal discharge is normal (leukorrhea). IUD and implants provide no protection against sexually transmitted infections and a barrier method, such as condoms, should be used when there is risk of STI transmission[2,3,6,7,8] If discharge is malodorous, discolored, or accompanied by itching, pain, nausea/vomiting, new onset bleeding, etc, schedule appointment for screening for vaginal infection/STI[3,6,7,8]	Leukorrhea is a normal response to increased progesterone levels with hormonal contraception[7,8] Changes in vaginal flora and pH are common with IUDs, especially with concurrent irregular bleeding. Decreases in lactobacilli and increases in anaerobic bacteria commonly result in benign but bothersome changes in vaginal discharge[9] Triage for signs of infection and schedule appointment for screening if vaginal or uterine infection is suspected. Infections >3 weeks after IUD insertion date are usually vaginal and related to STI risk, BV, or candidiasis[6,8]. Risk of PID is elevated only for the first 3 weeks after IUD insertion. Oral antibiotics are appropriate for mild to moderate PID, with reassessment after 48-72 hours. If no clinical improvement is seen, IUD should be removed and sent for culture and an alternate form of contraception should be initiated[6]
Hormonal Side Effects: Excess hair growth	These are reported but uncommon side effects of the hormonal IUDs, more common with implants, and	The hormonal IUDs may have systemic hormonal effects such as hirsutism and acne due to

Weight gain Headache Mood changes Breast tenderness Acne	usually resolve as hormone levels stabilize and the patient's body accommodates to the new normal. Manage symptomatically. Few patients discontinue use due to these symptoms[2,4,6,8]	decreased androgen suppression in the absence of exogenous estrogen present with prior method[6,8] Weight gain is usually minimal and can be mitigated with lifestyle changes[6] Headache, mood changes, breast tenderness can result from intolerance of hormones but frequently resolve after 3-6 months of use[6,8]
Partner Discomfort During Sex with IUD	Educate patient on how to check for strings and instruct to tuck them around cervix for comfort or can come in to have strings trimmed[2,6,7,8]	IUD string length should be approximately 3-4cm from the os. Strings that are too short or too long may cause discomfort for the partner during penetration[6]
Pain at Implant Insertion Site	**1.** Reassurance that low-level pain or discomfort is normal for several days after insertion in absence of other symptoms[4,7] **2.** Cool compresses, 20 minutes on & off for 2-3 cycles may relieve discomfort[3] **3.** Once daily low-dose ibuprofen or naproxen can be recommended in the absence of contraindications[3,4,7]	Pain accompanied by fever, discharge at the insertion site, and/or significant swelling and erythema suggests infection or rejection and should be evaluated by a provider in the office[4]

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