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Intrauterine Device Initiation Following Gonococcal and Chlamydial Infections:

A Practice Workflow Initiative

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Abstract

Background: Unplanned pregnancy remains an issue in the United States. The intrauterine device (IUD) is a solution. The IUD is safe for most women and is recommended for adolescents. Misconceptions exist around IUDs and sexually transmitted infections (STIs) caused by *Neisseria gonorrhoeae* and *Chlamydia trachomatis*. Accepted guidelines ensure the management of these STIs and subsequent, safe initiation of the IUD.

Methods: The use of best practice alerts preserves the healthcare team's adherence to clinical guidelines.

Conclusion: This IUD provision initiative creates a workflow for the interprofessional team to ensure the safe initiation of an IUD to clients with a gonococcal or chlamydial infection.

Keywords: intrauterine devices, long-acting reversible contraception, unplanned pregnancy, sexually transmitted diseases, *Neisseria gonorrhoeae*, *Chlamydia trachomatis*, workflow, quality improvement, best practice alerts, clinical decision-making

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Introduction

To combat the persistently high rate of unplanned pregnancy in the United States, the Healthy People 2020 objectives appeal for the endowment of highly effective contraception.¹ Accessible long-acting reversible contraception (LARC), including the intrauterine device (IUD) and the subdermal implant, can meet this goal. The unplanned pregnancy rate is highest for those under the age of 25.² Women under age 25 are at the highest risk for the sexually transmitted infections (STI), *N. gonorrhoeae* (NG) and *C. trachomatis* (CT).³ Although the presence of a known or suspected gonococcal or chlamydial infection is a contraindication to IUD initiation, the IUD may be safely inserted after the infection is cured.³ Adherence to these IUD best practices by some healthcare providers is lacking and limits IUD provision.^{4,5} The lack of compliance to IUD best practices creates an interruption in contraception management. Employing electronic health record (EHR) generated best practice alerts (BPAs) can safeguard the healthcare team's adherence to clinical guidelines. Improving the adherence to evidence-based IUD best practices, relative to gonococcal or chlamydial infections, supports the goal to decrease unplanned pregnancies. The goal of this article is to present a clinical practice initiative, using BPAs, to preserve the safe provision of an IUD to clients seeking IUD initiation, following the diagnosis of a gonococcal or chlamydial infection.

The management of the IUD relative to a gonococcal or chlamydial infection is well documented.³ Inconsistent adherence to this management may impair IUD provision. In a clinical example, a client requesting an IUD is found to have a chlamydial infection after STI screening and the forthcoming IUD insertion appointment is canceled despite the infection being

resolved.⁶ In this example, the client goes without highly reliable contraception. The electronic health record (EHR) can facilitate the healthcare team's workflow, adherence to IUD best practices, and client-centered goal of IUD initiation. Employing a computer-based workflow, such as best practice alerts, for the interprofessional healthcare team can optimize clinical decision-making and patient outcomes.⁷ The World Health Organization (WHO) recommends a task sharing approach to optimize family planning services using a team-based model.⁸ This IUD provision initiative uses Lewin's Theory of Planned Change to mobilize the healthcare team in its adoption.⁹ The use of BPAs in this IUD provision initiative can prevent missed or delayed diagnosis and treatment of STIs and thwarted IUD provision. By implementing this IUD provision initiative, the healthcare team can ensure that appropriate contraception is safely provided.

Background and Significance

Approximately 45% of all pregnancies in the United States are unplanned.² Women less than age 25 have higher rates of contraception failure, unplanned pregnancy, and pregnancy-related morbidity, compared to older clients.¹⁰ The IUD is a safe, highly effective LARC that can decrease the unplanned pregnancy rate.¹¹ As LARC, the IUD is a, "set it and forget it" method for three to ten years, duration varies by the type of IUD. Although LARC is more effective than other types of birth control methods, with a failure rate of less than one percent, it remains underutilized.^{12,13} Adherence to IUD best practices by some healthcare providers is lacking and limits IUD provision.^{4,5} Bias against IUD use, by some healthcare providers and the public, restricts its utilization, manifested by an overall use of 11.8% in the United States.¹⁴

Healthcare provider adherence to IUD best practices can be optimized with the use of EHR-generated best practice alerts (BPAs). These BPAs, as a clinical decision-support system,

have shown to significantly improve outcomes in preventative healthcare practices including the prescription of appropriate, timely treatment therapies.¹⁵

Underutilization Due to Lack of Knowledge

In regards to IUD use and STIs, two dominant themes are evident. The first theme is the lack of knowledge perpetuated by misconceptions, fears, and biases of some healthcare providers and the public. Research demonstrates that some healthcare providers are reluctant to use the IUD out of fear of complications, such as pelvic inflammatory disease (PID).^{16,17} This bias is due to a memory of an older generation of IUDs, such as the Dalkon Shield in the 1970s, that led to these complications. The current generation of IUDs is deemed safe for most women.¹⁷ In a landmark study to assess provider IUD knowledge, Kohn et al. identified barriers to IUD provision and assessed the likelihood of provider recommendation of the IUD to adolescents.¹⁸ The study surveyed 162 employees of New York City school based health centers (SBHC). The SBHC team included healthcare providers, health educators, social workers, nurses, medical assistants, and receptionists. Misconceptions and misinformation on client eligibility for the IUD were isolated as barriers and restricted provision of the IUD. Most of the SBHC team would not recommend the IUD to clients with a remote or recent history of a STI, PID, or if they were non-monogamous. Lastly, this sentinel study found that the risk of STIs was a barrier to IUD recommendation by SBHC providers.¹⁸ A recent study elucidates women's healthcare provider beliefs in the IUD and found statistically significant increases in IUD beliefs and usage after an educational intervention on IUD best practices, including IUD initiation after a gonococcal or chlamydial infection.¹⁹

Likewise, the public's lack of access to and information on the IUD creates underutilization.^{20,21} A perceived lack of control and autonomy, often due to historical

contraceptive coercion, have been cited by some women as barriers to IUD use.^{21,22} These attitudes are exceptionally well-defined in the Black and Latina populations who possess the highest rates of unplanned pregnancy.^{2,22} It is imperative that women receive access to reliable contraceptive counseling and provision, relevant to their needs. Shared contraceptive decision-making and consistency of LARC counseling need improvement.²³ Comprehensive, nonjudgmental, informed consent for contraceptive care can decrease barriers to use.

Safety of the IUD and Sexually Transmitted Infections

The second theme pertaining to IUD underutilization is the safety of the IUD, particularly related to STIs. The safety of the IUD and its relationship to STIs is well studied since routine screening for gonococcal and chlamydial infections is recommended before initiation.³ The IUD has relatively few contraindications and is deemed safe for all age groups regardless of STI history.³ *C. trachomatis* is the most common STI and one of the possible causes of PID.³ Studies have found that the rate of complications, such as PID, is less than one percent for all types of IUDs and age groups.^{24,25} The overall lifetime risk of PID is 4.4%.²⁵ Drake et al. studied a high-risk population of IUD users (N=283) and found that 49.5% had a history of a STI and a rate of PID of 0.7%, at 12 months of IUD use.²⁵ This study supports the safety of IUDs and that its use should not be restricted due to the fear of STIs.²⁵ The ongoing education of the healthcare team and the public can facilitate IUD provision.^{19,26} The translation of evidence-based guidelines into clinical practice can be reinforced by using EHR-generated best practice alerts. This paper presents a workflow strategy for IUD provision to clients desiring IUD initiation who test positive for *N. gonorrhoeae* and *C. trachomatis*.

Methods

The literature was reviewed on IUDs, STIs, clinical practice workflow, clinical decision support systems, and best practice alerts (BPA). Clinical decision support systems, such as BPAs, are created in the EHR to notify the healthcare team of serious events like abnormal results and needed follow-up. The research on evidence-based IUD and STI guidelines and BPAs were examined to develop the IUD initiative workflow. The CDC guidelines on IUDs and STIs serve as the foundational clinical resource for this workflow.^{3,16} As a clinical decision support system, BPAs are user-friendly and functional. Best practice alerts prompt the healthcare team to identify and treat a gonococcal and/or chlamydial infection and confirm that the IUD insertion is scheduled appropriately.

Motivating the healthcare team to change their current workflow can be challenging. Consistent with the barriers to IUD utilization, barriers to organizational productivity include individual biases that can create conflicts among the team.²⁸ Lewin's Theory of Planned Change (Lewin) crafts the framework for the organizational modifications necessary to adopt the IUD initiative.⁹ Lewin's theory expedites the exploration of the organizational factors related to barriers to IUD provision. Factors such as healthcare team member biases and misconceptions about IUDs and STIs are explored in Lewin's first stage of change, unfreezing. Lewin's second stage, transitioning, represents the active workflow modifications that the team executes as they begin the initiative. Lewin's third and final stage, refreezing, solidifies the changes, and establishes the workflow sustainability.⁹

Results

Unfreezing

The goal of this clinical practice initiative is to safeguard the safe provision of an IUD to clients requesting IUD insertion who screen positive for a gonococcal or chlamydial infection.

To implement the initiative, modifications in the organization's workflow require preparation and buy-in from the team. Lewin's theory describes this stage as unfreezing.⁹ In this first stage, the interprofessional team meets to discuss the problem, review the research on IUDs, STIs, and workflow practices, and offer solutions. The entire health care team, including reception staff, information technology (IT), nursing, medical assistants, and providers (nurse practitioners, midwives, physicians, physician assistants), works collaboratively. A project champion is selected to lead and evaluate the initiative. The team agrees on the resources that will be used to guide IUD best practices. In this case, current CDC STI guidelines and IUD recommendations may be embraced for reference.^{3,6,16} Next, the team reviews the advantages and disadvantages of adopting the workflow strategy using best practice alerts (BPA). This workflow is adopted by the healthcare team to promote the adherence of IUD and STI best practices and protects the provision of highly effective contraception. Engaging all the members of the healthcare team ensures a successful first step.

Transitioning

The second step in Lewin's model, transitioning, encourages the staff to actively engage in making the necessary workflow changes to ensure that the clinical guidelines and BPAs are followed.⁹ Team member roles are defined by the project champion. An expert on IUD and STI best practices, such as a provider or nurse, conducts this education for the interprofessional team. The IT department educates on the BPA process. Education is provided at weekly staff meetings in the two weeks leading up to the implementation. Together, the team considers the types of BPAs to institute and what they would like flagged. The IT department is crucial in this execution. The IT department creates the suggested BPAs to alert the team that, 1). a client, scheduled for an IUD insertion, tests positive for a gonococcal and/or chlamydial infection, 2).

proper STI treatment is initiated within 72 hours, and 3). the IUD insertion appointment is scheduled at least one week after treatment. The BPAs also alert the team when a client misses the IUD insertion appointment, initiating a phone call (computerized or human) to reschedule the IUD insertion. The transition from planning to engaging the changes completes this step in the initiative (see Table 1).

Refreezing

The final stage in Lewin's theory, refreezing, commences as the team executes the new workflow.⁹ The team members assigned workflow roles are resources for the team throughout the implementation. Periodic audits of the BPAs and workflow validate its use and the reliability of the technology. Likewise, IUD and STI best practices are reviewed for currency. For instance, the CDC updates the STI guidelines every five years. When there is a change in the clinical practice guidelines, the workflow will be modified to reflect this update. Refreezing supports the initiative's sustainability. Each team member engages in the process to solidify the workflow and create a new standard of care.⁹

In addition to the updating of clinical best practices over time, the evaluation of this practice initiative is recommended. A query by diagnosis codes for gonococcal and chlamydial infection and IUD insertion enables the confirmation of appropriate treatment and successful IUD insertion (see Table 1). In the treatment of the STIs, a target goal of 100% is necessary to confirm that the clients are treated appropriately. For the IUD provision, a goal of 70-90% is optimal to ensure clients that request an IUD had a scheduled insertion appointment and IUD successfully placed. Patient satisfaction is another measure to consider in the evaluation process. Surveys exploring patient satisfaction of their contraceptive and STI counseling and IUD insertion can identify strengths in the IUD provision initiative and opportunities for

improvement. Evaluation data are shared with the interprofessional team during regularly scheduled office meetings. The team-based appraisal of the IUD provision initiative promotes its sustainability.

Discussion

To address the unplanned pregnancy rate of 45% in the US, this IUD provision initiative can prevent missed opportunities for safe IUD insertions.² This initiative mobilizes the healthcare team to adopt BPAs, which promote IUD and STI best practices, prompting the treatment of STIs and successful IUD insertions. It is imperative to address IUD misconceptions through the education on IUD and STI best practices. Employing Lewin's theory generates proactive collaboration among the team to change the office workflow. Team members are assigned roles to execute the workflow and evaluate the initiative. Ongoing evaluation of the workflow's use of BPAs, timeliness of STI treatment, rate of IUD insertions, and patient satisfaction is expected. This IUD practice initiative pursues the improvement of safe IUD provision to clients seeking IUD initiation, following the diagnosis of a gonococcal or chlamydial infection.

Relevance to Clinical Practice

Research has shown high patient satisfaction and exemplary effectiveness of the IUD, particularly in the adolescent and young adult population.²⁹ The appropriate education of the interprofessional healthcare team and the public is paramount for the utilization of the IUD and can decrease unplanned pregnancy.⁴ To begin the initiative, the team shares their biases and knowledge of IUDs and STIs. The team's unfreezing of personal beliefs and biases allows for change as they are educated on the current IUD and STI evidence. The educated healthcare team

provides thorough, individualized client counseling, particularly related to complications, which can decrease barriers.

Consistent contraceptive counseling and screening for STIs provides safety and confidence for clients. It is recommended to screen for *N. gonorrhoeae* and *C. trachomatis* for clients at high risk, such as those under age 25, before an IUD insertion. Clients at low risk may be screened at the time of the IUD insertion.³ The initiation of an IUD is contraindicated with an active or suspected genital infection, like gonococcal or chlamydial infections.¹⁶ Prompt identification and treatment of gonococcal or chlamydial infections can prevent complications, such as PID. The insertion of the IUD may proceed after the infection is cured, or one week after treatment.³ Although the IUD is inserted and removed by a healthcare provider, a client may have the IUD removed whenever it is desired. There may be a misconception that the IUD must remain in place for the entire duration of use. Reinforcing that the IUD may be removed at any time can promote a sense of control for the client. Individualizing contraceptive care, based on sound clinical decision-making, optimizes the delivery of the appropriate care. This initiative provides an efficient workflow to ensure the safe provision of highly effective IUD contraception.

Safeguarding IUD initiation can be expedited by the use of automated BPAs in the EHR. The acceptance of clinical decision support systems, as BPAs, are designed to promote proficient patient care, adherence to clinical guidelines, and serve as computerized quality assurance measures.^{30,31} The team decides on the types of BPAs and how to use them in the EHR workflow. Long et al. identify that nurses prefer pop-up alerts to flag that an abnormal finding or assessment is recorded, which precipitates the next steps.³² The way in which the BPAs notify the team can be modified as the workflow progresses. For instance, the team chooses that the

EHR will initiate a pop-up BPA when a positive chlamydial result is obtained. This provokes the medication order to be generated. In the case of a chlamydial infection, in the absence of allergies, a one-time dose of azithromycin 1 gram by mouth is generated.³ Next, the nurse notifies the provider who authorizes the treatment. Once treatment has been prescribed, another BPA corroborates that the IUD insertion appointment is scheduled appropriately, at least one week after medication administration. Relative to these STIs, medication compliance is deemed high since both are treated in a one-time dose, chlamydia orally and gonorrhea as an intramuscular injection of 500 mg of ceftriaxone administered by the healthcare professional.³ A final BPA is triggered if the client misses the IUD insertion appointment. The workflow can be programmed to identify unique client variables such as medication allergies. This quality assurance measure guides the appropriate STI treatment for each client. Nurses prefer technology that assists in providing safe and effective care individualized to the patients.³² Best practice alerts, agreed upon by the team and configured by the IT staff, ensure the expeditious treatment of STIs and safe provision of the IUD.

Unplanned pregnancy remains a problem in the US. A solution is the improved utilization of LARC, including the IUD. This IUD provision initiative establishes a workflow to support this goal. Employing Lewin's theory, the interprofessional team confronts biases and misinformation about the IUD and STIs and educates each other on best practices. Empowered with accurate data, the team executes best practices through the use of BPAs as quality assurance measures. Community health centers, private offices, and institutions may enable this workflow to streamline or replace their contraceptive care protocols. After its implementation, the evaluation of the workflow, clinical outcomes, and patient satisfaction can assess whether the goals of the initiative and population served are being met using the SQUIRE 2.0 guidelines.³³

This IUD provision initiative enables the healthcare team to validate that highly effective contraception is safely provided. Facilitating access to safe, reliable contraception can decrease unplanned pregnancies.

Table 1. Intrauterine Device Provision Workflow

| 1. Goal: To increase the provision of the intrauterine device (IUD) to eligible clients who test positive for <i>N. gonorrhoeae</i> (NG) and <i>C. trachomatis</i> (CT), thereby decreasing the unplanned pregnancy rate. | | | | |
|---|--|---|---|---|
| Objective | Activities | Timeframe | Responsible Team Member | Outcomes |
| A. Adopt clinical practice guidelines for clients with positive gonococcal (NG) and/or chlamydia (CT) result preceding an IUD insertion. | 1. Educate and agree upon best practice guidelines to execute the IUD provision initiative. ^{1,2,3} | Within one month | Healthcare team: receptionists, medical assistants, nurses, IT staff, and providers (nurse practitioners, midwives, physicians, physician assistants) | 1. Clinical practice guidelines for IUD provision are adopted and instituted as office policy within one month. |
| | 2. Notify and treat the client of the positive result according to CDC guidelines and allergy status. | Within 72 hours of a positive result | Nursing staff (RN or LPN), as authorized by the provider, provider | 2. 100% of clients with a positive NG or CT result will be notified and treated. |
| | 3. Document the treatment of partner(s) referral or treatment. | Immediately upon notification | Nursing staff, provider | 3. 100% of partner(s) notification is documented. |
| | 4. Confirm IUD placement appointment is booked to ensure safe yet timely insertion. | Insertion visit is scheduled at least one week after STI treatment, ideally within two weeks of the counseling visit. | Nursing, reception, or medical assistant | 4. 100% of clients have an IUD insertion appointment booked at least one week after treatment. |

| Objective | Activities | Timeframe | Responsible Team Member | Outcomes |
|---|---|---|-----------------------------------|---|
| <p>B. Develop best practice alerts (BPA) to ensure the desired IUD insertion.</p> | <p>1. Collaborate with the IT team to develop BPAs notifying staff that:</p> <p>a). a client, scheduled for an IUD insertion, tests positive for a gonococcal and/or chlamydial infection,</p> <p>b). proper treatment of infection is initiated within 72 hours,</p> <p>c). IUD insertion appointment is scheduled at least one week after treatment,</p> <p>d). IUD insertion appointment was missed triggering a follow up call to reschedule.</p> | <p>Within one month of initial team meeting</p> | <p>Project champion, IT staff</p> | <p>1. Within one month, active BPAs notify staff that:</p> <p>a). a client, scheduled for an IUD insertion, tests positive for a gonococcal and/or chlamydial infection,</p> <p>b). proper treatment of infection is initiated within 72 hours,</p> <p>c). IUD insertion appointment is scheduled at least one week after treatment,</p> <p>d). IUD insertion appointment was missed triggering a follow up call to reschedule.</p> |

2. Goal: Evaluate client outcomes and satisfaction pertaining to the prompt treatment of a sexually transmitted infection and safe, effective contraception via IUD placement.

| Objectives | Activities | Timeframe | Responsible Team Member | Outcomes |
|--|--|--|--|--|
| A. Improve client outcomes by the prompt treatment of a gonococcal (NG) and/or chlamydial (CT) infection. | 1. Conduct an electronic health record (EHR) query for positive NG/CT results and prescribed treatment following initiation of workflow BPAs. | Beginning two weeks after implementation of the initiative | Project champion, nursing staff | 1. One month after implementation, EHR query will reveal that 100% of clients with a positive NG/CT result will be prescribed treatment. |
| B. Improve client outcomes as evidenced by successful IUD insertion. | 1. Conduct a billing code query of IUD insertions following the clinical practice initiative initiation. | Monthly for 3 months, then every 6 months | Project champion | 1. One month after implementation, EHR review will reveal that 70-90% of clients will have an IUD inserted. |
| C. Evaluate client satisfaction of their contraception and infection counseling, treatment, and IUD insertion. | 1. Create a client satisfaction survey on contraception and infection counseling, treatment, and IUD insertion. 2. Distribute satisfaction survey at the time of counseling and insertion visits. | Within one month of initiative launch One month after initiative launch and ongoing | Project champion, nursing, providers Nursing, receptionist, medical assistant | 1. Client satisfaction survey created and implemented one month after initiative started. 2. 100% of clients will receive and 60% of clients will complete the survey |

¹Centers for Disease Control and Prevention. 2015 Sexually Transmitted Diseases Treatment Guidelines. <https://K.V..cdc.gov/std/tg2015/default.htm>.

²Curtis KM, Jatlaoui TC, Tepper NK, Zapata LB, Horton LG, Jamieson DJ, et al. U.S. Selected Practice Recommendations for Contraceptive Use, 2016. *MMWR Recomm Rep.* 2016; 65(4):1-66. <http://dx.doi.org/10.15585/mmwr.rr6504a1>.

³Esposito CP. Intrauterine devices in the context of gonococcal infection, chlamydial infection, and pelvic inflammatory disease: Not mutually exclusive. *J Midwifery Womens Health.* 2020; 65(4):562-566. <http://dx.doi.org/10.1111/jmwh.13120>

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