How to place an IUD with minimal patient discomfort

Managing your patient's pain during IUD placement may make it a more comfortable and satisfying experience for both of you

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CASE Nulliparous young woman desires contraception

An 18-year-old nulliparous patient presents to your office inquiring about contraception before she leaves for college. She not only wants to prevent pregnancy but she also would like a method that can help with her dysmenorrhea. After receiving nondirective counseling about all of the methods available, she selects a levonorgestrel intrauterine device (LNG-IUD). However, she discloses that she is very nervous about placement. She has heard from friends that it can be painful to get an IUD. What are these patient's risk factors for painful placement? How would you mitigate her experience of pain during the insertion process?

IUDs are highly effective and safe methods of preventing unwanted pregnancy. IUDs have become increasingly more common; they were the method of choice for 14% of contraception users in 2016, a rise from 12% in 2014.[1] The Contraceptive CHOICE project demonstrated that IUDs were most likely to be chosen as a reversible method of contraception when unbiased counseling is provided and barriers such as cost are removed. Additionally, rates of continuation were found to be high, thus reducing the number of unwanted pregnancies.[2] However, pain during IUD insertion as well as the fear and anxiety surrounding the procedure are some of the major limitations to IUD uptake and use. Specifically, fear of pain during IUD insertion is a substantial barrier; this fear is thought to also exacerbate the experience of pain during the insertion process.[3]

This article aims to identify risk factors for painful IUD placement and to review both nonpharmacologic and pharmacologic methods that may decrease discomfort and anxiety during IUD insertion.

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What factors contribute to the experience of pain with IUD placement?

While some women do not report experiencing pain during IUD insertion, approximately 17% describe the pain as severe.[4] The perception of pain during IUD placement is multifactorial; physiologic, psychological, emotional, cultural, and circumstantial factors all can play a role (**TABLE 1**). The biologic perception of pain results from the manipulation of the cervix and uterus; noxious stimuli activate both the sympathetic and parasympathetic nervous systems. The sympathetic system at T10-L2 mediates the fundus, the ovarian plexus at the cornua, and the uterosacral ligaments, while the parasympathetic fibers from S2-S4 enter the cervix at 3 o'clock

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Medical, physical, psychological, and sociodemographic factors contribute to pain experience during IUD placement

and 9 o'clock and innervate the upper vagina, cervix, and lower uterine segment.[4,5] Nulliparity, history of cesarean delivery, increased size of the IUD inserter, length of the uterine cavity, breastfeeding status, relation to timing of menstruation, and length of time since last vaginal delivery all may be triggers for pain. Other sociocultural influences on a patient's experience of pain include young age (adolescence), Black race, and history of sexual trauma, as well as existing anxiety and beliefs about expected pain.[3,5,6-8]

It also is important to consider all aspects of the procedure that could be painful. Steps during IUD insertion that have been found to invoke average to severe pain include use of tenaculum on the cervix, uterine stabilization, uterine sounding, placement of the insertion tube, and deployment of the actual IUD.[4-7]

A secondary analysis of the Contraceptive CHOICE project confirmed that women with higher levels of anticipated pain were more likely to experience increased discomfort during placement.[3] Providers tend to underestimate the anxiety and pain experienced by their patients undergoing IUD insertion. In a study about anticipated pain

TABLE 1 Factors associated with increased pain during IUD placement[4-6,8,9]

Medical and physical factors	Psychological and sociodemographic factors
Nulliparity	Adolescence
History of cesarean delivery	Mood disorders
Size of inserter	History of trauma
Non-breastfeeding	Previous painful placement
History of dysmenorrhea	Anticipation of pain
Cervical resistance	Baseline anxiety
Relationship to menstruation	Black race[a]

[a]Black race as a risk factor likely is due to complex social and institutional realities due to a history of racial discrimination, higher distrust in the medical system, underestimation of lived trauma, and inadequately treated pain.[6]

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during IUD insertion, clinicians were asked if patients were "pleasant and appropriately engaging" or "anxious." Only 10% of those patients were noted to be anxious by their provider; however, patients with a positive screen on the PHQ-4 depression and anxiety screen did anticipate more pain than those who did not.[6] In another study, patients estimated their pain scores at 30 mm higher than their providers on a visual analog scale.[7] Given these discrepancies, it is imperative to address anxiety and pain anticipation, risk factors for pain, and offerings for pain management during IUD placement to ensure a more holistic experience.

What are nonpharmacologic interventions that can reduce anxiety and pain?

There are few formal studies on nonpharmacologic options for pain reduction at IUD insertion, with varying outcomes.[4,8,10] However, many of them suggest that establishing a trusting clinician-patient relationship, a relaxing and inviting environment, and emotional support during the procedure may help make the procedure more comfortable overall (**TABLE 2**).[4,5,10]

Education and counseling

Patients should be thoroughly informed about the different IUD options, and they should be reassured regarding their contraceptive effectiveness and low risk for insertion difficulties in order to mitigate anxiety about complications and future fertility.[11] This counseling session can offer the patient opportunities for relationship building with the provider and for the clinician to assess for anxiety and address concerns about the insertion and removal process. Patients who are adequately informed regarding expectations and procedural steps are more likely to have better pain management.[5] Another purpose of this counseling session may be to identify any risk factors that may increase pain and tailor nonpharmacologic and pharmacologic options to the individual patient.

TABLE 2 Nonpharmacologic interventions for reducing pain during IUD placement[4,8,10]

• Counseling about expectations
• Education about safety and insertion process
• Verbal distraction (ie, "verbacaine")
• Heat therapy
• Music
• Inhaled lavender
• Ultrasonographic guidance

Environment

Examination rooms should be comfortable, private, and professional appearing. Patients prefer a more informal, unhurried, and less sterile atmosphere for procedures. Clinicians should strive to engender trust prior to the procedure by sharing information in a straightforward manner, and ensuring that staff of medical assistants, nurses, and clinicians are a "well-oiled machine" to inspire confidence in the competence of the team.[4] Ultrasonography guidance also may be helpful in reducing pain during IUD placement, but this may not be available in all outpatient settings.[8]

Distraction techniques

Various distraction methods have been employed during gynecologic procedures, and more specifically IUD placement, with some effect. During and after the procedure, heat and ice have been found to be helpful adjuncts for uterine cramping and should be offered as first-line pain management options on the examination table. This can be in the form of reusable heating pads or chemical heat or ice packs.[4] A small study demonstrated that inhaled lavender may help with lowering anxiety prior to and during the procedure; however, it had limited effects on pain.[10]

Clinicians and support staff should engage in conversation with the patient throughout the procedure (ie, "verbacaine"). This can be conducted via a casual chat about unrelated topics or gentle and positive

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Several nonpharmacologic techniques can reduce pain at insertion, including education, counseling, ultrasound guidance, distraction, heat therapy, music, etc

coaching through the procedure with the intent to remove negative imagery associated with elements of the insertion process.[5] Finally, studies have been conducted using music as a distraction for colposcopy and hysteroscopy, and results have indicated that it is beneficial, reducing both pain and anxiety during these similar types of procedures.[4] While these options may not fully remove pain and anxiety, many are low investment interventions that many patients will appreciate.

What are pharmacologic interventions that can decrease pain during IUD insertion?

The literature is more robust with studies examining the benefits of pharmacologic methods for reducing pain during IUD insertion; strategies include agents that lessen uterine cramping, numb the cervix, and soften and open the cervical os. Despite the plethora of studies, there is no one standard of care for pain management during IUD insertion (**TABLE 3**).

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Several pharmacologic interventions have been studied for pain reduction, with no one standard to use during IUD insertion

Lidocaine injection

Lidocaine is an amine anesthetic that can block the nociceptive response of nerves upon administration; it has the advantages of rapid onset and low risk in appropriate doses. Multiple randomized controlled trials (RCTs) have examined the use of paracervical and intracervical block with lidocaine.[9,12-15] Lopez and colleagues conducted a review in 2015, including 3 studies about injectable lidocaine and demonstrated some effect of injectable lidocaine on reduction in pain at tenaculum placement.[9]

Mody and colleagues conducted a pilot RCT of 50 patients comparing a 10 mL lidocaine 1% paracervical block to no block, which was routine procedure at the time.[12] The authors demonstrated a reduction in pain at the tenaculum site but no decrease in pain with insertion. They also measured pain during the block administration itself and found that the block increased the overall pain of the procedure. In 2018, Mody et al[13] performed another RCT, but with a higher dose of 20 mL of buffered lidocaine 1% in 64 nulliparous patients. They found that paracervical block improved pain during uterine sounding, IUD insertion, and 5 minutes following insertion, as well as the pain of the overall procedure.

De Nadai and colleagues evaluated if a larger dose of lidocaine (3.6 mL of lidocaine 2%) administered intracervically at the anterior lip was beneficial.[14] They randomly assigned 302 women total: 99 to intracervical block, 101 to intracervical sham block with dry needling at the anterior lip, and 102 to no intervention. Fewer patients reported extreme pain with tenaculum placement and with IUD (levonorgestrel-releasing system) insertion. Given that this option requires less lidocaine overall and fewer injection points, it has the potential to be an easier and more reproducible technique.[14]

Finally, Akers and colleagues aimed to evaluate IUD insertion in nulliparous adolescents. They compared a 1% paracervical block of 10 mL with 1 mL at the anterior lip and 4.5 mL at 4 o'clock and 8 o'clock in the cervicovaginal junction versus depression of the wood end of a cotton swab at the same sites. They found that the paracervical block improved pain substantially during all steps of the procedure compared with the sham block in this young population.[16]

TABLE 3 Pharmacologic interventions for reducing pain during IUD placement[8,9,12]

Oral naproxen 220 mg 90 minutes before procedure
Lidocaine/prilocaine cream
20 mL paracervical block with lidocaine 1%
Lidocaine spray 10%
Misoprostol in select groups (history of cesarean delivery and/or nulliparous patients)

Nonsteroidal anti-inflammatory drugs

Nonsteroidal anti-inflammatory drugs (NSAIDs) show promise in reducing pain during IUD placement, as they inhibit the

Key recommendations

- Patients should be counseled regarding the benefits and risks of the IUD, expectations for placement and removal, and offered the opportunity to ask questions and express their concerns.
- Providers should use this opportunity to assess for risk factors for increased pain during IUD placement.
- All patients should be offered premedication with naproxen 220 mg approximately 90 minutes prior to the procedure, as well as heat therapy and the opportunity to listen to music during the procedure.
- Patients with risk factors for pain should have pharmacologic strategies offered based on the available evidence, and providers should reassure patients that there are multiple strategies available that have been shown to reduce pain during IUD placement.
  - —Nulliparous patients and patients with a history of a cesarean delivery may be offered the option of cervical ripening with misoprostol 400 µg vaginally 2 to 4 hours prior to the procedure.
  - —Patients with a history of sexual trauma should be offered self-administered lidocaine 1% or lidocaine-prilocaine formulations to increase comfort during examinations and speculum placement.
  - —All other patients can be offered the option of a paracervical or intracervical block, with the caveat that administration of the block itself also may cause some pain during the procedure.
  - —For those patients who desire some sort of local anesthetic but do not want to undergo a lidocaine injection, patients should be offered the option of lidocaine spray 10%.
  - —Finally, for those patients who are undergoing a difficult IUD placement, ultrasound guidance should be readily available.

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All patients should be offered premedication with naproxen 220 mg approximately 90 minutes prior to the procedure, as well as heat therapy and the opportunity to listen to music during the procedure

production of prostaglandins, which can in turn reduce uterine cramping and inflammation during IUD placement.

Lopez and colleagues evaluated the use of NSAIDs in 7 RCTs including oral naproxen, oral ibuprofen, and intramuscular ketorolac.[9] While it had no effect on pain at the time of placement, naproxen administered at least 90 minutes before the procedure decreased uterine cramping for 2 hours after insertion. Women receiving naproxen also were less likely to describe the insertion as "unpleasant." Ibuprofen was found to have limited effects during insertion and after the procedure. Intramuscular ketorolac studies were conflicting. Results of one study demonstrated a lower median pain score at 5 minutes but no differences during tenaculum placement or IUD insertion, whereas another demonstrated reduction in pain during and after the procedure.[8,9]

Another RCT showed potential benefit of tramadol over the use of naproxen when they were compared; however, tramadol is an opioid, and there are barriers to universal use in the outpatient setting.[9]

Topical anesthetics

Topical anesthetics offer promise of pain relief without the pain of injection and with the advantage of self-administration for some formulations.

Several RCTs evaluated whether lidocaine gel 2% applied to the cervix or injected via flexible catheter into the cervical os improved pain, but there were no substantial differences in pain perception between topical gel and placebo groups in the insertion of IUDs.[9]

Rapkin and colleagues [15] studied whether self-administered intravaginal lidocaine gel 2% five minutes before insertion was

helpful;[15] they found that tenaculum placement was less painful, but IUD placement was not. Conti et al expanded upon the Rapkin study by extending the amount of time of exposure to self-administered intravaginal lidocaine gel 2% to 15 minutes; they found no difference in perception of pain during tenaculum placement, but they did see a substantial difference in discomfort during speculum placement.[17] This finding may be helpful for patients with a history of sexual trauma or anxiety about gynecologic examinations. Based on surveys conducted during their study, they found that patients were willing to wait 15 minutes for this benefit.

In Gemzell-Danielsson and colleagues' updated review, they identified that different lidocaine formulations, such as a controlled-release lidocaine and a lidocaine-prilocaine compound, resulted in slight reduction in pain scores at multiple points during the IUD insertion process compared with controls.[8] Two RCTs demonstrated substantial reduction in pain with administration of lidocaine spray 10% during tenaculum placement, sounding, and immediately after IUD placement compared with a placebo group.[18,19] This may be an appealing option for patients who do not want to undergo an injection for local anesthesia.

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Providers tend to underestimate the pain and anxiety experienced by their patients undergoing IUD insertion

Nitrous oxide

Nitrous oxide is an odorless colorless gas with anxiolytic, analgesic, and amnestic effects. It has several advantages for outpatient administration including rapid onset, rapid recovery, high safety profile, and no residual incapacitation, enabling a patient to safely leave the office shortly after a procedure.[20]

Nitrous oxide was studied in an RCT of 74 young (12-20 years of age) nulliparous patients and found to be effective for decreasing pain during IUD insertion and increasing satisfaction with the procedure.[20] However, another study of 80 nulliparous patients (aged 13-45 years) did not find any reduction in pain during the insertion procedure.[21]

Prostaglandin analogues

Misoprostol is a synthetic prostaglandin E1 analog that causes cervical softening, uterine contractions, and cervical dilation. Dinoprostone is a synthetic prostaglandin E2 analog that has similar effects on the cervix and uterus. These properties have made it a useful tool in minor gynecologic procedures, such as first trimester uterine aspiration and hysteroscopy. However, both have the disadvantage of causing adverse effects on gastric smooth muscle, leading to nausea, vomiting, diarrhea, and uncomfortable gastric cramping.

Several RCTs have examined the use of misoprostol administration approximately 2 to 4 hours before IUD placement. No studies found any improvement in pain during IUD insertion, but this likely is due to the discomfort caused by the use of misoprostol itself.[9] A meta-analysis and systematic review of 14 studies found no effect on reducing the pain associated with IUD placement but did find that providers had an easier time with cervical dilation in patients who received it. The meta-analysis also demonstrated that patients receiving vaginal misoprostol were less likely to have gastric side effects.[22] In another review of 5 RCTs using 400 µg to 600 µg of misoprostol for cervical preparation, Gemzell-Danielsson et al found reductions in mean pain scores with placement specifically among patients with previous cesarean delivery and/or nulliparous patients.[8]

In an RCT, Ashour and colleagues looked at the use of dinoprostone 3 mg compared with placebo in 160 patients and found that those in the dinoprostone group had less pain during and 15 minutes after the procedure, as well as ease of insertion and overall higher satisfaction with the IUD placement. Dinoprostone traditionally is used for labor induction in the United States and tends to be much more expensive than misoprostol, but it shows the most promise of the prostaglandins in making IUD placement more comfortable.

Conclusion: Integrating evidence and experience

Providers tend to underestimate the pain and anxiety experienced by their patients undergoing IUD insertion. Patients' concerns about

pain and anxiety increase their risk for experiencing pain during IUD insertion. Patient anxieties, and thus, pain may be allayed by offering support and education prior to placement, offering tailored pharmacologic strategies to mitigate pain, and offering supportive and distraction measures during the insertion process. ●

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