Using simulation to practice IUD insertion and removal techniques

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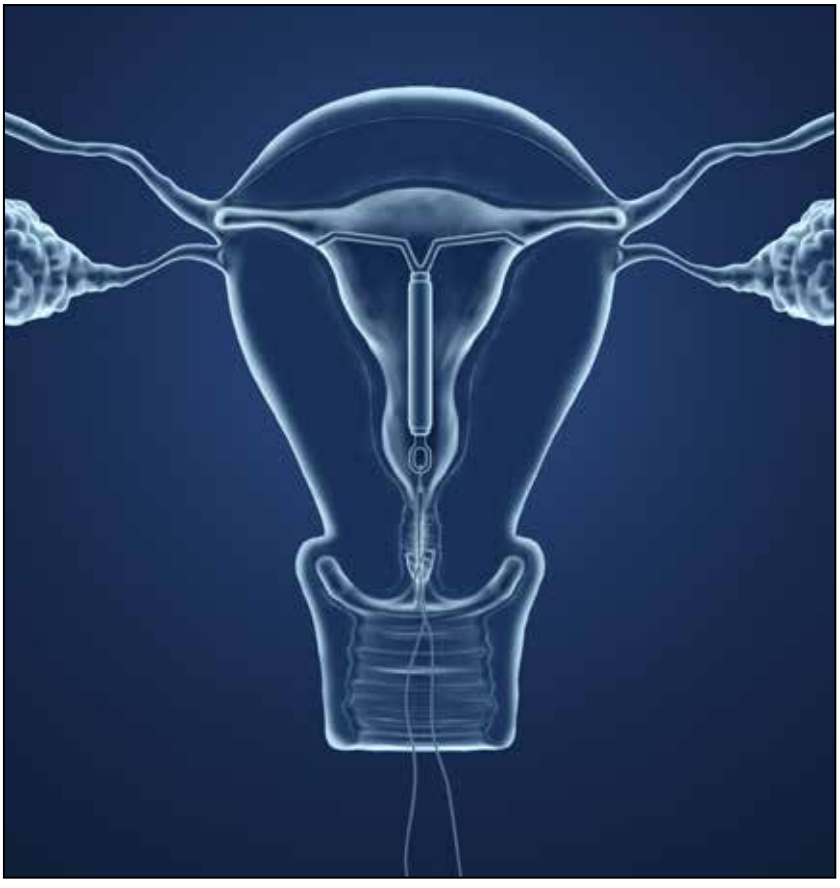
This article provides novice nurse practitioners and nurse practitioner students with detailed information regarding techniques for safely and accurately inserting and removing an intrauterine device (IUD). The author provides step-by-step instructions for performing IUD insertion and removal, as well as a simulation module to enable practice and enhancement of IUD insertion and removal skills.

KEY WORDS: simulation, intrauterine device, IUD, IUD insertion, IUD removal, office gynecology procedures



Nurse practitioners (NPs) providing care to women routinely perform minimally invasive office gynecology procedures such as insertion and removal of an intrauterine device (IUD). NPs should know the indications and contraindications regarding IUD use, as well as have the skills to perform these procedures safely and competently. The busy, fast-paced clinical setting is not necessarily conducive for novice NPs and NP students to acquire the skills and confidence needed to perform office gynecology procedures independently.[1] Simulation is a valuable tool that utilizes a controlled, risk-free environment and provides step-by-step guidance, enabling NPs to strengthen their skills, increase their confidence, reduce potential errors, and manage possible dilemmas before they insert and remove IUDs in patients.

The purpose of this article and accompanying simulation module is to help novice NPs and NP students enhance their skills in inserting and removing IUDs safely and accurately. The primary focus is not on how to insert each type of IUD but, rather, to review general practice recommendations and techniques that ensure successful insertion and removal of all IUDs based on uterine and cervical os size and position.

Brief overview about available IUDs

Long-acting reversible contraceptive (LARC) methods available in the United States, which include five different IUD products and the etonogestrel implant, are considered the most reliable form of reversible contraception.[2] Fewer than 1 in 100 women becomes pregnant within 1 year of IUD insertion.[2] One copper IUD (Cu-IUD)[3] and four IUDs containing levonorgestrel (LNG) 13.5 mg,[4] 19.5 mg,[5] or 52 mg[6,7] are available in the U.S. (*Table 1*).[3-7] Each IUD is considered a safe and effective contraceptive for anyone with a uterus, regardless of parity status, who does not have a contraindication identified.[2] The Cu-IUD is approved for 10 years' use and the LNG-IUDs for 3-5 years' use.

Table 1. Available IUDs in the United States[3-7]

Brand name	Indication(s)	FDA–approved duration of use	Dosing	LNG release rate
Kyleena®	Contraception	5 years	LNG 19.5 mg	17.5 mcg/day after 24 days, and declines to 7.4 mcg/day after 5 years
Liletta®	Contraception	5 years	LNG 52 mg	19.5 mcg/day initially and declines progressively to about 17.0 mcg/day at 1 year, 14.8 mcg/day at 2 years, 12.9 mcg/day at 3 years, and 11.3 mcg/day at 4 years
Mirena®	Contraception and treatment of HMB	5 years	LNG 52 mg	20 mcg/day initially; rate is reduced by about 50% after 5 years
ParaGard® T380A	Contraception and emergency contraception	10 years	Hormone free; releases copper	—
Skyla®	Contraception	3 years	LNG 13.5 mg	14 mcg/day after 24 days and declines to 5 mcg/day after 3 years

HMB, heavy menstrual bleeding; LNG, levonorgestrel.

Indications

The Cu-IUD, the only nonhormonal IUD option, is indicated for birth control. Although the Cu-IUD is used as a safe and reliable emergency contraceptive for women who meet standard criteria for IUD use, it is not FDA approved for this purpose.[8] All four LNG-IUDs are indicated for pregnancy prevention and one also is indicated for treatment of heavy menstrual bleeding (HMB) in women who choose to use an IUD.[6]

Contraindications

IUDs should not be inserted in individuals with[2,9]:

- allergy to a component of the device;
- Wilson's disease (only the Cu-IUD is contraindicated);
- pregnancy or suspected pregnancy;
- known or suspected cervical, uterine, or breast cancer (in patients with breast cancer, only the LNG-IUD is contraindicated);
- acute pelvic inflammatory disease (PID);
- postpartum sepsis within the past 3 months;
- uterine anomaly;
- unexplained vaginal bleeding or acute cervicitis;
- untreated gonorrhea or chlamydia;
- infected abortion within the past 3 months; or
- hepatic tumors or active hepatic disease (only the LNG-IUD is contraindicated);

IUD insertion

Case study

Eva, a G0, 19-year-old single female on day 3 of her menstrual cycle, presents to the clinic for a contraception consult with her NP. She reports having one sex partner during her lifetime, with whom she is using condoms. She wants to switch to a more reliable form of birth control that also might help ease her menstrual cramps. She likes the idea of an IUD and requests insertion during this visit. Prior to the procedure, the NP assesses Eva's health history and finds no contraindications for use of an LNG-IUD. The NP uses criteria from the U.S. Selected Practice Recommendations for Contraceptive Use, 2016[A] *(SPR) to be reasonably sure that Eva is not pregnant (Box).[2] Screening for sexually transmitted infections (STIs) performed 3 months earlier, at Eva's well-woman visit, yielded negative results, and she remains with the same partner. Therefore, rescreening for STIs is not indicated.[2] Visual inspection of the cervix shows no signs or symptoms (S/S) of an STI and bimanual examination findings are normal. The NP informs Eva about potential risks and side effects of the IUD insertion procedure and obtains her informed consent. An LNG-IUD is successfully inserted, with minimal discomfort and no complications.*

Pre-procedure consultation

This consultation is conducted to ensure that a patient is aware of all available contraceptive options, as well as the risks, benefits, and potential side effects of an IUD and its insertion. Women with menstrual

Box. How to be reasonably certain that a woman is not pregnant[2]

A practitioner can be reasonably certain that a woman is not pregnant by confirming that she has no signs/symptoms of a pregnancy and she:

- is ≤7 days after the first day of a normal menstrual period;
- has not had sex since the first day of her last normal menstrual period;
- has been using a reliable contraceptive method consistently and correctly;
- is ≤7 days after a spontaneous miscarriage or induced abortion;
- is within 4 weeks' postpartum; and/or
- is breastfeeding completely or almost completely, amenorrheic, and <6 months postpartum.

problems such as dysmenorrhea or HMB may benefit from using an LNG-IUD (these symptoms are not likely to improve with the Cu-IUD). Potential risks and side effects of IUD insertion include uterine perforation, expulsion, vaginal spotting/bleeding, pelvic pain, amenorrhea, PID, vaginal discharge, ovarian cysts, and ectopic pregnancy.[2] Of note, the risk for ectopic pregnancy is not increased by use of an IUD *per se* (compared with no contraceptive method), but if a pregnancy does occur, the likelihood of it being ectopic rather than intrauterine is increased.

A thorough evaluation of the individual's health history, screening needs, and pregnancy risks, as well as a pelvic exam, is performed prior to IUD insertion.[2] The primary purpose of the health history is to identify contraindications. If a patient has not been screened for gonorrhea and chlamydia according to national STI screening guidelines, this screening can be done at the time of insertion.[2] Cervical cancer is a contraindication to IUD insertion. However, screening asymptomatic women with cervical cytology before IUD insertion is not required.[2] Pregnancy assessment should be performed using SPR criteria to be reasonably certain that a woman is not pregnant (*Box*).[2] A urine pregnancy test may be done but is not always reliable.[2] A pelvic exam and cervical inspection are indicated to assess for anatomic anomalies and signs of an infection (e.g., cervicitis, abnormal discharge, cervical motion tenderness). Last, the NP ascertains the patient's desire for pain prophylaxis during the procedure.

Procedure directions

After pregnancy assessment, an intramuscular injection of ketorolac 60 mg or an oral dose of ibuprofen 800 mg may be offered for pain prophylaxis.[10] While waiting for the medication to be absorbed, the NP reviews the risks and benefits of IUD insertion with the patient and obtains her signature on the consent form. The NP asks the patient about any allergies she may have, especially those related to device content and to solutions that may be used to cleanse the cervix. The NP assists the patient in reclining in the dorsal lithotomy position on the exam table with both feet in the stirrups, provides draping, and confirms her comfort.

After cleaning her hands with sanitizer, the NP dons clean gloves and applies a small amount of water-based lubricant on her index and middle fingers before performing a bimanual exam to confirm the size and shape of the patient's uterus, along with the position of the cervix. The fundus is located slightly below the symphysis pubis bone, in an anteverted position, and slightly tilted forward at the cervix toward the bladder. The cervix is in a midline position.

After performing the bimanual exam, the NP changes gloves, inserts a Peterson speculum into the vagina, and visualizes the cervix. No signs of cervicitis or abnormal discharge are noted. (If any S/S of a cervical infection were noted, the NP would not proceed with the procedure until gonorrhea and chlamydia were ruled out or treated if present.) Because of the lack of S/S of infection and the facts that this patient had negative screening results 3 months previously and no new partners, no STI tests are needed at this visit. The NP cleanses the cervix with povidone iodine or another antiseptic solution if an allergy to iodine is confirmed.

In order to follow sterile technique, the NP works with a medical assistant for the remainder of the procedure. The NP removes the clean gloves and applies sterile gloves. Prior to opening the IUD package, she uses a uterine sound

Table 2. Minimum and maximum uterine depth requirements for IUD insertion[3-7]

Brand name	Minimum depth	Maximum depth
Kyleena	Not provided	Not provided
Liletta	5.5 cm	Not provided
Mirena	6 cm	10 cm
ParaGard	6 cm	9 cm
Skyla	Not provided	Not provided

Photograph 1

Photograph 2

Photograph 3

to confirm patency of the cervical os and to measure the depth of the uterus. If cervical stenosis is confirmed or patency of the cervical canal cannot be established, the NP suspends the procedure and consults the patient about the next steps, which might include using misoprostol to help soften and dilate the canal.[2] If patency is confirmed, then the uterine sound is used to evaluate uterine depth; adequate depth is confirmed based on the IUD package insert recommendations (*Table 2*).[3-7] The sound is then removed.

The assistant opens the IUD package so that the NP maintains a sterile field. Using sterile technique, the NP removes the IUD from the package and loads it into the top of the barrel based on package insert recommendations. LNG-IUDs are assembled with the wings folded up into the inserter, whereas the Cu-IUD is assembled with the wings folded down into the inserter (*Photograph 1 and Photograph 2*). For Liletta, one additional step is needed to secure it in place inside the inserter. The NP needs to pull the threads at the bottom straight back toward her and then pull the threads upward or downward to lock them in the cleft located at the bottom of the inserter. Next, the NP adjusts the flange to the measured depth based on uterine sounding.

Following IUD assembly, the top of the IUD barrel is inserted through the speculum into the vagina and moved with gentle pressure into the cervical os upward toward the uterus. If the NP encounters difficulty inserting the tip of the barrel into the cervical os, she avoids forcing it, which could lead to uterine perforation. Resistance may be due to cervical instability, internal cervical os stenosis, or the natural curvature in the cervix or uterus. If the tip of the barrel slides freely into the initial cervical os but meets resistance internally, the NP uses a cervical dilator to slightly enlarge the internal cervical os diameter or an instrument such as a tenaculum, a ring forceps, or a long hemostat to help stabilize and straighten the cervix and uterus (*Photograph 3*). If the uterus is anteverted in position, gentle traction is used with the nondominant hand to pull the tenaculum downward and outward, away from the patient.[10] If the uterus is retroverted, gentle traction is applied to the tenaculum, pulling it upward and outward.[10]

Once the IUD is inserted through the cervix into the uterus and meets resistance at the top of the fundus, the NP pulls it back 1.5-2 cm from the fundus, allowing ample space

Simulation enables NPs to refine skills, increase confidence, reduce potential errors, and manage possible dilemmas in a controlled, risk-free environment prior to inserting and removing IUDs.

for release of the IUD.[3-7] The IUD is released into the uterus per package insert directions for each type as follows:

- LNG-IUDs: With the thumb placed on the insertion slider button, the NP pulls down, releasing the IUD into the uterus, waits 10-15 seconds to allow the arms to fully open, and then advances the inserter upward until resistance is felt at the top of the fundus. The slider is pulled all the way back to fully release the threads. The inserter is then withdrawn from the uterus and vagina.
- Cu-IUD: The plunger is inserted into the bottom of the barrel and pushed upward, releasing the IUD into the uterus. The NP waits 10-15 seconds to allow the arms to fully open and then advances the inserter upward until resistance is felt at the top of the fundus. The plunger and the barrel are removed from the cervical os and the vagina.

The NP uses long sterile scissors to trim the IUD threads. She cuts them horizontally, leaving 2-3 cm visible outside the cervical os (*Photograph 4*).[3-7] She avoids cutting the threads at an angle to prevent sharpness on the tips.

The NP confirms the patient's stability and comfort throughout the procedure but especially afterward, observing for syncopal S/S. The patient is assisted to an upright sitting position and assessed for a few minutes before she stands.

Photograph 4

Post-procedure patient education

The patient sees and touches the portion of the threads that were cut off. Using this portion, the NP teaches the patient how to perform a monthly thread check after each menstrual period. If amenorrhea is achieved, the NP advises the patient to check the threads on the same date of each month and to return to the clinic if she cannot feel them. IUD threads are checked by performing these steps:

- Insert the index finger of the dominant hand into the vagina.
- Feel for the cervix, a round structure that feels like the tip of the nose.
- Rotate the index finger gently all the way around the outer portion of the cervix in a clockwise or counterclockwise motion until the threads pass over the finger.

The NP informs the patient about the most common S/S experienced with IUD insertion, which include fainting upon quickly changing positions (shortly after insertion), intermittent pelvic pain lasting 1-3 days, and intermittent vaginal bleeding from days to months.[10] The patient is advised to notify the NP if she experiences uterine cramping not relieved with an NSAID, abnormal malodorous vaginal discharge, or fever or if she cannot feel her threads.

Depending on the type of IUD inserted, the first day of the patient's last menses, and the timing of the most recent coital episode, the patient may not need to use backup protection during the first month.[2] However, condom use is always encouraged with a new sex partner. No backup method is needed if an

LNG-IUD is inserted during the first 7 days of menses onset; if more than 7 days have elapsed since day 1 of her period, she should abstain from sex or use a backup method for 7 days.[2] Backup contraception is not necessary after insertion of the Cu-IUD.[2]

The patient receives a reminder card that includes the IUD name and lot number, insertion date, and date that the IUD needs to be removed and replaced. A follow-up IUD exam within 4-6 weeks post-insertion is recommended on each IUD package insert,[3-7] but this exam is not considered necessary based on the SPR.[2] All women are encouraged to return for an annual well-woman exam[11] or sooner for follow-up if they have any concerns.

Diagnosis and billing codes

The diagnosis in this case is "encounter for insertion of intrauterine contraception device." The *ICD-10* code is Z30.430. The *CPT* code for IUD insertion is 58300. A J code associated with IUD insertion covers the cost of the device. In this case study, J7296 is the J code for the LNG-IUD 19.5 mg.[12] The American Congress of Obstetricians and Gynecologists (ACOG) provides a **quick guide to LARC reimbursement**[B].

Description of the simulation

Simulation is a cost-effective way to practice performing IUD insertion. Supplies (*Table 3*) may be purchased from a medical or pharmaceutical supplier, a grocery store, or an online store. Most of these supplies are disposable, but some are reusable. This IUD insertion simulation can be performed at a cost of about $6. A metal uterine sound or a wooden pencil is used to bore a 1-cm round hole into the tip of each pepper to resemble a cervical os. Readers can access a video **link**[C] for the simulation.

Table 3. Supplies for IUD insertion and removal simulation procedures

Supplies	Cost	Location
3 large poblano or banana peppers (curved and straight)	$.30 each x 3 = $.90	Grocery store
IUD training inserter and device	No cost (provided by pharmaceutical suppliers)	Allergan: liletta.com Bayer: hcp.kyleena-us.com/; hcp.mirena-us.com; hcp.skyla-us.com CooperSurgical: hcp.paragard.com/
Speculum	Plastic (reusable): $.50 each Metal (reusable): $42 each	Medical supply company
Individually wrapped povidone iodine swab sticks (disposable)	$.30 each	Medical supply company
Underpad (disposable)	$.45 each	Medical supply company
Large-tip clean cotton swabs (disposable)	$.01 each	Medical supply company
Gloves (disposable)	Clean: $.04 per pair Sterile: $1.04 per pair	Medical supply company
Uterine sound	Plastic (reusable): $3 each Metal (reusable): $35 each	
Ring forceps	Plastic (reusable): $.99 each Metal (reusable): $8.85 each	Medical supply company

VIEW: Simulation for IUD insertion [C]

Indications for IUD removal

The most common reason for IUD removal is the experience of unwanted side effects. Irregular bleeding and abdominopelvic pain are the most common reasons women request removal of an LNG-IUD.[13] HMB is the most common reason the Cu-IUD is removed.[14] Other indications for IUD removal are desire for pregnancy, lack of further need for contraception, partial IUD expulsion, severe anemia secondary to increased bleeding, pregnancy, and development of a malignancy.[9] If pregnancy occurs with an IUD in place, the patient is evaluated for a possible ectopic pregnancy. The IUD is removed if the threads are visible or can be retrieved safely from the cervical canal.[2,15] Although controversial, a diagnosis of PID is no longer considered an indication for IUD removal.[15]

IUD removal

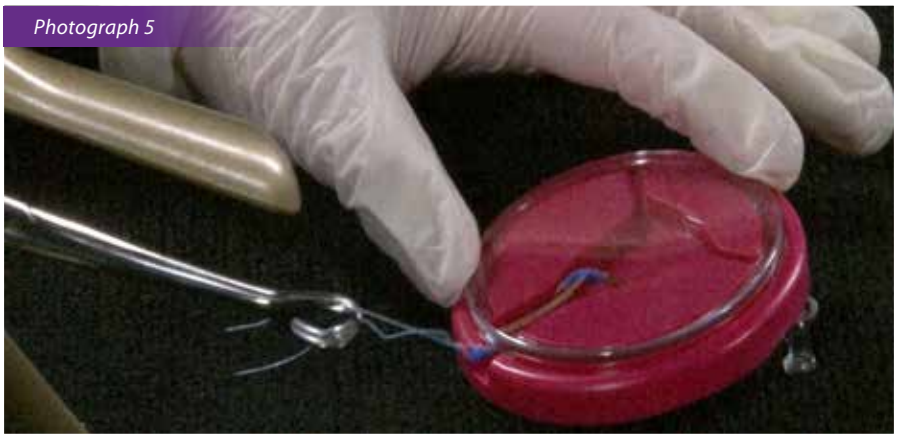
Case study

Fay, a G2 P2012, postmenopausal 55-year-old married female in a monogamous relationship with her spouse, presents to the clinic to have her Cu-IUD removed 10 years after insertion. She denies having vaginal bleeding, discharge, or odor or menopausal symptoms. She had her final menstrual period 3 years ago. Because Fay is up to date on her scheduled screenings and is not having any new S/S, the NP proceeds to inform her about potential risks and side effects of IUD removal and obtains her informed consent. Using a pair of ring forceps, the NP removes an intact Cu-IUD with minimal discomfort and no complications.

Pre-procedural consultation

A brief consultation is performed immediately prior to removing an IUD to review the rationale and to ensure that the patient knows the risks, benefits, and potential side effects of the procedure. Potential risks and side effects include bleeding, pelvic pain,

Photograph 5



and syncope. After reviewing this information, the NP obtains the patient's signature on the consent form.

Procedure directions

The NP assists the patient in reclining in the dorsal lithotomy position on the exam table with both feet in the stirrups, provides draping, and confirms her comfort. After cleaning her hands with sanitizer, the NP dons clean gloves, inserts a Graves speculum into the vagina, visualizes the cervix, and confirms the presence of two IUD threads protruding from the cervical os. The NP notes the absence of signs of cervicitis or suspicious discharge for gonorrhea or chlamydia, which would warrant screening. She closes a ring forceps securely around both IUD threads, applies gentle tension, and pulls the IUD out of the vagina (*Photograph 5*). The NP then removes the speculum from the vagina. She shows the intact IUD to the patient and disposes of it in a red biohazard container. The NP confirms the stability and comfort of the patient throughout the procedure but especially afterward, observing for syncopal S/S. The patient is assisted to an upright sitting position and assessed before she stands.

Post-procedure patient education

The NP informs the patient about the most common symptoms experienced with IUD removal, including fainting upon quickly changing positions (shortly after removal), intermittent pelvic pain, and intermittent vaginal bleeding. The patient is advised to notify the NP if she experiences uterine cramping not resolved with an NSAID, abnormal vaginal discharge, or fever.

The NP evaluates the patient's continuing need for contraception and prescribes what, if anything, is needed. IUD reinsertion following removal of an expired IUD can easily and safely be performed.

Diagnosis and billing codes

The diagnosis in this case is "encounter for removal of IUD." *The ICD-10* code is Z30.432. The *CPT* code for IUD removal is 58301. An encounter for removal of an IUD and reinsertion has a specific *ICD-10* code of Z30.433. There is no specific *CPT* code for removal and reinsertion of an IUD.

Description of the simulation

A pair of plastic or metal ring forceps, the only additional item needed for the IUD removal simulation, can be purchased from a medical supply company or an online store for about $1 or $10, respectively. Readers can access a video link[C] for this simulation.

VIEW: Simulation for IUD insertion[C]

Conclusion

Nurse practitioners can perform minimally invasive gynecology procedures such as insertion and removal of an IUD. The fast-paced clinical setting is not an optimal environment for the novice NP or NP student to obtain the necessary skills and confidence to independently perform office gynecology procedures. Simulation provides an opportunity to refine skills, increase confidence, reduce potential errors, and manage possible dilemmas in a controlled, risk-free environment prior to inserting and removing IUDs in patients.

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Web resources

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